LECTURES TO PRACTISING MIDWIVES

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LECTURES TO PRACTISING MIDWIVES

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GIFT

TO

MRS. SCHARLIEB, M.D., M.S.,

TO WHOM I OWE MY EARLIEST KNOWLEDGE OF MIDWIFERY,

AND FROM WHOM I HAVE RECEIVED MUCH KINDNESS,

I ♥ AFFECTIONATELY DEDICATE

THIS LITTLE BOOK

PREFACE

In sending out Dr. Victoria Bennett's little book to the world, I feel that she has conferred a boon not only on the midwives, for whom it is primarily intended, but also on nurses and many others who are responsible for the care of pregnant and puerperal women.

This modest little book is full of useful information conveyed in simple language, well calculated to bring home the truths taught to the simplest of minds. It would no doubt have been far easier for Dr. Bennett to write a book in scientific language; but it would then have been useful only to medical men and women. She has, however, very successfully translated scientific truth into homely language, and in doing so, has, I venture to think, conferred a boon on suffering women and their anxious attendants.

MARY SCHARLIEB, M.D., M.S.

London,
March, 1909.

AUTHOR'S NOTE

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LECTURES TO PRACTISING MIDWIVES

CHAPTER I

THE LAW AS IT AFFECTS MIDWIVES

THE Midwives Act was passed in 1902, for two reasons, viz. :

1. To insure the better training of midwives.
2. To regulate their practice.

Before the passing of this Act the midwife had no status in this country ; nor was the fact that a woman bore the title of midwife a guarantee to the public that she had undergone any special training or possessed any special skill in midwifery.

The Act provided for the establishment of a central body—the Central Midwives Board (C.M.B.)—to manage the work of putting into force the provisions of the Act for the country at large, and handed over the direct supervision of midwives to existing local authorities—viz., the County Councils of the several counties of England and Wales, which are now known as the Local Supervising Authority (L.S.A.) in any given county.

The *Central Midwives Board* consists of representatives from the principal medical and nursing bodies in the country, and has its offices at Caxton House, Westminster, S.W. Its duties are as follows:

1. To frame rules for the direction of midwives, which latter, when approved by the Privy Council, have the force of law. It is within the power of the Board to alter these rules from time to time, but each alteration, before it has the force of law, must be approved by the Privy Council, who usually give their approval for a stated term—*e.g.*, the present rules are to remain in force until September 30, 1909. They are published in the little brown book with which all midwives are familiar.

2. To arrange a scheme of training which shall prepare candidates for the Board's examination.

The present scheme, which is to be regarded as a minimum of training, requires that candidates shall—

(*a*) Examine, watch the progress of labour, and deliver twenty women.

(*b*) Nurse twenty lying-in women during the ten days following labour.

(This is to be done under the supervision either of a doctor or of an experienced midwife who has been specially approved by the C.M.B. for the purpose.)

(*c*) Attend, during a period of three months, lectures upon midwifery and the duties of midwives, given by a doctor who has been specially approved as a teacher by the C.M.B.

(*d*) Pass the examination of the C.M.B.

3. To appoint examiners and arrange for the conduct of examinations.

4. To issue certificates to midwives who have undergone the required training and passed the examination.

5. To cancel certificates when midwives have been convicted of malpractice, negligence, or misconduct, and to order the removal of the names of the wrong-doers from the roll of midwives.

6. In a few instances to restore to the roll the name of a midwife which has been removed. (For details, see C.M.B. Rules, pp. 16 and 17.)

7. To issue annually a roll of the names and addresses of all midwives throughout the country, and to keep it accessible for inspection by the public at all reasonable times.

The fees charged are one guinea for admission to the Board's examination; fifteen shillings for re-admission if the candidate fail to pass; ten shillings and sixpence if, after entry, she fails to present herself owing to illness, and produces a doctor's certificate stating the nature of the illness; and ten shillings for a new certificate in case of restoration to the roll after removal of her name for misconduct, etc.

Duties of the Local Supervising Authority.

These are usually carried out either by or under the auspices of the Medical Officer of Health (M.O.H.) to the *county* in which the midwife practises, and include:

1. The exercise of a general supervision of the work

of all midwives practising within its area, and, in particular, to secure a proper inspection of every midwife's register of cases and bag of appliances; to receive notices from her as required by the rules of the C.M.B.; also, when thought necessary, to have an inspection made of her place of residence, and an investigation of her mode of practice.

2. To suspend from practice any midwife when such suspension seems necessary to prevent the spread of infection—*e.g.*:

(*a*) When the midwife has been in attendance upon or in contact with any case of puerperal fever, or other infectious illness, or a dead body, until such time as she and her clothes and appliances have been disinfected to the satisfaction of the L.S.A.

(*b*) When, owing to ignorance, carelessness, etc., the midwife neglects to keep the rules as to cleanliness, or omits to carry and to use suitable antiseptics.

(*c*) When she has about her any condition of disease which would be likely to endanger the health of her patients.

3. To give due notice of the provisions of the Act to all whom they may concern within its area.

4. To investigate charges of malpractice, negligence, or misconduct, made against any midwife practising in its area, and, if a *prima-facie* case be established, to bring such to the knowledge of the C.M.B.

5. To notify the C.M.B. of any change in the name or address of any midwife practising within its area.

These being the powers and duties of the several bodies entrusted by the Government with the carrying

out of the Act, how is the midwife to arrange her conduct in order to escape censure? Simply, she must learn and understand the rules, and then carry them out. The inspectors under the Midwives Act are always ready to explain and advise upon points of difficulty, and the midwife would do well to turn to them when perplexing situations arise; they come to her as friends, and, as long as she is loyal and anxious to do right, they remain friendly, and will support a midwife who, being in the right, is wrongfully accused, or is the subject of adverse criticism.

The operation of the Act comes in in three stages:

First. Between 1902 and 1905 all persons practising as midwives were asked to show what training or experience they had had to justify them in undertaking the work.

If they possessed and could produce any certificate of sound training, or if they had been practising as midwives for one year before the passing of the Act, and brought a certificate of good character, they were given the certificate of the C.M.B., and allowed to use the title of midwife.

Secondly. After this period of grace, which ended with March, 1905, no person was allowed to use the title of midwife unless she possessed the certificate of the C.M.B.

Thirdly. In and after 1910 no person will be allowed to practise midwifery habitually and for gain unless she possesses the certificate of the C.M.B. This will not prevent the training of pupils, nor the practice of monthly nurses under medical supervision, nor the

rendering of aid by any woman to a patient in an emergency until other help can be obtained; but it will preclude uncertified people from earning their living by the practice of midwifery.

One more provision of the Act touches midwives closely: it is that no certified midwife may employ an uncertified person as her substitute.

There are penalties for breaches of these provisions.

The possession of the certificate of the C.M.B. has begun to be the hall-mark of a good monthly nurse, and all persons wishing to practise as such would do well to obtain this certificate.

Another Act which sometimes affects midwives is the Notification of Births Act, 1907. This Act is adoptive—*i.e.*, it does not apply to the country in general, but only to those places in which, with the sanction of the Local Government Board, the authorities have adopted it.

The authorities entrusted with its carrying out are, in London, the Borough Councils, and, in the provinces, the Urban or Rural District Councils. When once these bodies have adopted it, the Act becomes law, and must be obeyed.

The principal provision is that every birth taking place after the twenty-eighth week of pregnancy must be notified to the Medical Officer of Health within thirty-six hours of its occurrence, whether the child be born alive or dead. This is an advance upon previous laws, which took no account of stillbirths.

But who is to notify?

In the first place, it is the duty of the father; but

if he is absent, any responsible person who has been in attendance upon the mother within six hours of her delivery should do it, and in those cases in which the midwife is the only responsible person the duty rests with her.

If the notification is not sent, there is a penalty of twenty shillings for the person who has neglected to send it; but the midwife is freed from responsibility in the matter if she has explained to the father (or other responsible person) what is required, and has reason to believe that he has notified the birth.

The Act provides no fee for this notification, but the Medical Officer of Health will often give midwives stamped post-cards upon which to send the notice, and in a few cases will pay them a small fee; he is not, however, obliged to do this.

Rules of Central Midwives Board.

These, in so far as they concern the practising midwife, may be arranged under the following headings:

1. Cleanliness and measures to be taken for preventing the spread of infection.
2. Care of the mother and child.
3. As to necessity of calling in medical aid.
4. Notifications and keeping of register, notes, etc.

1. The midwife must be *scrupulously clean in every way.* This, besides the absolute cleanliness of the hands, which is indispensable, should include frequent cleansing of the whole body and hair (if possible, a daily bath), frequent changes of clothing, both inner

and outer, all of which should be of washable material. The outer garments are best made of linen or cotton, as these stand boiling; the underclothes—at least, those next the skin—should be of wool, to lessen the risk from the sudden changes of temperature to which the midwife is necessarily exposed; also the throat, teeth, eyes, and, so far as may be, the whole internal economy, of the midwife should be kept clean. A daily gargle with salt and hot water will keep the throat healthy; but if septic infection has occurred, an antiseptic, such as cyllin, should be used in the water (10 drops to a teacupful of water). The teeth should all be sound (if they are not, a dentist should be consulted), and should be thoroughly cleansed by brushing inside and outside, across and up and down, at least once a day—for choice just before bedtime. Those nurses who wear artificial teeth should put them to soak in borax and water during the night (1 teaspoonful to the pint).

The eyes should be frequently washed with boracic lotion.

A saline aperient taken twice a week has a great effect in keeping the alimentary tract clean and healthy, in preventing foulness of breath, and in helping one to bear the daily worries with that cheerfulness so necessary in those who have to be much amongst sickness and suffering.

The bag or basket in which the appliances are carried must be lined with washable material, and the lining must be removable. It is best that it should be white, not brown, as white shows the dirt. It is

necessary to have several linings. When made, these should be washed, boiled, ironed, and put into a newly ironed towel, and kept in it until required for use.

All appliances which touch the patient's genitals must be disinfected, preferably by boiling, immediately before use (for example, catheters, douche-nozzles, etc.). In buying apparatus, it is best to refuse any article which is not warranted to stand boiling.

A special sterilizer should be kept solely for boiling instruments, and the latter should be picked out of the boiling water with forceps and put into their own separate cases—*e.g.*, catheters and nozzles can be conveniently carried in a hard glass cylinder closed at one end with a rubber cork. Glass catheters, if used, require great care, as they are apt to become cracked near the eye. The crack is not easily seen when the light is poor, and the end is apt to come off and be left in the bladder. Metal or soft rubber catheters (Nos. 7, 8, and 9) are excellent. It is best to have one of each kind. They should be cleansed under the tap immediately after use, and boiled before being put away.

Metal vaginal nozzles, when they can be had, made on the principle of the vulcanite ones, with end to unscrew for cleansing, will be a great advance upon the present glass nozzles; in any case, a vaginal nozzle should not have a hole at the end. Also we look forward to a curved and longer rectal nozzle, which, being better adapted to the passage it has to enter, will lessen the difficulty of enema-giving.

A glass funnel, indiarubber tubing, and large catheter

form a convenient apparatus for the administration of enemata.

The rectal syringe and vaginal douche apparatus must be quite separate, and each should be kept in its own special case. Linen or *boilable* battiste answer well for this purpose.

Nail-brushes should be renewed as soon as they show signs of wear, and should be of large size. They should be boiled before use. The hands and arms of the midwife and the genitals of the patient must always be washed with soap and water, and swabbed with an efficient antiseptic before (1) examination, (2) passing of a catheter, (3) giving of a douche, or any other manipulation in the genital region; and the midwife must always cleanse and disinfect her hands before washing the patient's genitals. The tow or wool to be used for swabbing should be broken into small masses, baked, and stored in small linen bags which have been boiled; the same swab should never be used twice, and the direction of swabbing must always be *from before backwards—i.e.*, from vagina towards rectum; otherwise infection of vagina from rectum may occur.

Diapers and pads should never be used for swabbing the genitals; tenax (which can be bought from Messrs. Hawksley, Oxford Street, at 1s. 6d. per pound) is a very good material for making swabs. A piece of it laid upon the vulva makes a good antiseptic pad for use instead of a diaper, or between diaper and vulva.

Diapers and sanitary towels should be scrupulously clean, and should be rubbed with a hot iron, to destroy

surface germs, before being applied. The vaginal opening should, in short, be treated as a surgical wound it does, in fact, lead to an open wound, and a sure way of keeping out infective material is to guard the entry.

Whenever a midwife has been in attendance upon or in contact with any case of illness supposed to be infectious, she must carry out an elaborate disinfection before going to see any lying-in woman, whether it be to take a fresh case or to visit her other patients. This is especially necessary after puerperal fever, erysipelas, or scarlet fever, and also after performing the last offices for the dying or dead.

That contact with the dead body involves serious risk of erysipelas is well known, and although the midwife is allowed, in certain circumstances specified in the C.M.B. rules, to lay out the dead, she should be quite as carefully disinfected after doing so before again attending lying-in women as if she had been in attendance upon a case of puerperal fever.

The disinfection is carried out under the direction of the local Medical Officer of Health, who usually requires :

(*a*) A special cleansing and disinfection of the hands of the midwife, after the nails have been cut as short as possible.

(*b*) One or more baths to be taken, including the washing of the hair. This is very important, as infective material clings about the hair.

(*c*) A complete change of clothing. All garments worn at the infectious case to be sent to him for disinfection (including the boots or shoes).

(*d*) The bag of appliances to be sent to him for disinfection, and the destruction of any articles which cannot thus be rendered safe for future use.

In addition to this, the Medical Officer of Health directs the disinfection of the place at which the case occurred, and of the clothes, etc., of the patient. The midwife must now satisfy the Local Supervising Authority that this disinfection has been carried out (the inspector under the Midwives Act usually comes to investigate the matter), and must not resume her work until that authority is satisfied.

The breach of this rule would be attended by serious danger to other patients, and by very unpleasant consequences to the midwife, as the wilful spread of infection is equivalent to manslaughter.

Besides this routine disinfection after a case known to be infectious, the midwife is directed in doubtful cases in which the lochia have a foul smell to go home and change her dress, cleanse and disinfect her hands and arms, and sterilize her appliances before going on with her day's work.

2. *The care of mother and child* includes prompt attendance when called; the staying with the patient as long as necessary; visiting, nursing, and attention to comfort and cleanliness of patient, and directions as to diet. These will be more fully gone into later.

3. *As to the need for medical aid,* broadly speaking, the midwife should advise that a doctor be sent for whenever any abnormal condition is present. The midwife is not a doctor, and it is unwise for her to undertake the responsibility of treating cases of illness

or abnormality, both for her own and her patients' sakes. The special conditions requiring medical aid are fully set out in the rules, and every midwife should know them.

In sending for medical aid, it is of the utmost importance that the midwife should use words which will carry conviction of the urgency of the case to the mind of one who knows nothing but what he is told; for this is the condition of the doctor suddenly summoned to an unknown patient, and it is better for her to use one or two simple English words which express the state of affairs than to try to give the proper medical name of the condition—*e.g.*, the term 'flooding' or 'fits,' written clearly, would arrest the attention of the busy doctor, and give him the required information much more surely than some long word with the spelling of which the midwife is not quite familiar.

In this connection the following statement *of fact* is instructive:

A woman lay dying from rupture of the uterus, which had occurred during the birth of a dead child. The midwife, fully alive to the need for a doctor, made out the form and sent for one; but in stating the condition requiring medical aid she wrote, 'Baby born dead,' and said nothing about the mother's condition. It was night, *and the doctor came*, but surely no one could have wondered if he had postponed his visit until the morning, knowing that a dead baby had passed beyond his aid.

4. *Notifications and Keeping of Register, Notes, etc.*—Every midwife intending to practise during the year

must, in January, send to the L.S.A. a form filled up, stating her intention, name, address, and the number and date of her certificate. If during the year she changes her name or address, she should immediately notify the change to the same authority. If she had not intended practising, and should have taken one or more cases unexpectedly, she must, within forty-eight hours of taking the first case, notify the authority of the fact, giving the above-mentioned details which serve for her identification.

Three things occurring in her practice she must notify whenever they occur :

(*a*) The death of either mother or child if it occurs when the case is under the midwife's care—*i.e.*, before the arrival of a doctor.

(*b*) The birth of a stillborn child.

(*c*) Any illness or other condition requiring medical aid ; and in this case the midwife must send to the L.S.A. a copy of the form which she sent to the doctor, and must keep a copy for herself.

The midwife is required to keep a register, with notes under the headings set out in the C.M.B. rules. This should be kept as simply, clearly, and in as few words as possible, and the number of the case in the register should correspond with that upon the form used when medical aid is required. The midwife is also advised to keep fuller notes in another notebook. A convenient form for these other notes is a book of charts, with a ruled blank leaf opposite each. Upon the chart and in the space below it should be recorded the pulse-rate, temperature curve, curve representing

involution of the uterus (giving its height day after day above the pubes, measured in inches or finger-breadths), action of bowels, character of lochia, etc.; and upon the blank sheet opposite any special treatment which was carried out, the result of treatment, and any particularly interesting features of the case, should be briefly noted.

The midwife will thus, in course of time, get a collection of pictures, with short notes of the cases she has actually attended. She will be able to trace the first signs of mischief, see in what order they occurred, what features were present in the gravest cases—*e.g.*, she will see that a rising pulse-rate is the first sign of sepsis, and that, when accompanied by a large uterus which is not becoming smaller in the ordinary way, it usually means sapræmia; she will see that, when promptly treated, threatening cases have cleared up without developing septicæmia; she will, in short, build up and furnish for herself a store-house of knowledge more valuable than that which she can acquire in any other way. It takes a little time to keep such a book, but the result well repays the trouble. The things which we actually see impress themselves much more forcibly upon us than those of which we are told or of which we read, and the note-book will often afford light and guidance in times of perplexity, when perhaps other aid is not at hand.

CHAPTER II

ANATOMY

Bony Parts.—The pelvis is the bony canal through which the infant must pass on its way towards the external world. It is composed of four bones—the sacrum behind, the innominate bones on either side, and the coccyx below.

Each bone is at first made up of several parts, which unite later to form a consolidated whole; thus it becomes possible for a tunnel of very complex arrangement to undergo development—*e.g.*, the sacrum and coccyx are at first composed of several segments, like other parts of the vertebral column, or backbone, and each innominate bone consists of three parts, viz.:

(1) The ilium, or expanded upper part;

(2) The ischium, or solid lower portion, upon which the body rests when in the sitting posture; and

(3) The pubis, which, meeting in the middle line, with its neighbour of the opposite side, forms the pubic arch or pubes in front.

The junction between these three is in the form of a three-rayed star, having its centre at the acetabulum, or socket for the hip-joint. It is usually possible, even in old bones, to trace the three rays of the star.

The pelvis as a whole forms a girdle for the lower part of the body, encloses and protects the pelvic organs, supports the abdominal contents, and gives attachment to the muscles forming the walls of the abdomen and to those which move the legs and clothe the back.

Development.—For perfect pelvic development it is necessary that from the beginning the bone formed should be of good quality, and that the muscles attached to the pelvis should be properly exercised during the period of growth. Hence the importance of giving the girl a healthy start in life—first by *natural feeding*, which results in the formation of better bone than artificial, and later by giving a sufficiency of good plain food, containing the right amount of fat, proteid, and carbohydrate, in order that the tissues may be maintained in a healthy state, and also of insuring that she takes plenty of exercise in the fresh air, such as walking, running, etc., during growth. Active exercise of the muscles causes the bones to be pulled in the right direction, and each such pull aids in the development of the pelvis. Many of the girls in the large towns have been brought up in conditions opposed to natural growth and development. From the first they were fed upon improper food, which caused their bones to be of poor quality, soft, and wanting in strength and resistance; then during growth they had to carry heavy weights, and some of them to spend the best hours of the day sitting in stuffy rooms, with the result that they were too tired when work was over to take the necessary

exercise for development. Hence the frequency of ill-developed pelves in town women. Some of these conditions are being made better now, and will be remedied more and more as the years go on; but girls still show far too great a preference for sedentary occupations, which will not, unless sufficient exercise be taken, out of working hours, produce well-developed women. Not only do they lack proper exercise, but their appetite for wholesome food fails, and the rubbish which they eat produces indigestion and gastro-intestinal disturbance, and they become, to all intents and purposes, semi-starved.

The pelvis as a whole is usually described as consisting of two parts—(1) the false pelvis above, and (2) the true pelvis below, a dividing-line called the brim of the pelvis, which passes through the most prominent part of the sacrum (sacral promontory) behind, around the narrowing portion of the pelvis (iliopectineal line) at the sides, and along the upper part of the pubes in front.

The false pelvis, while being much less important to the midwife than the true, has its own special importance for her, inasmuch as it is easy to measure, and from its dimensions she can gain a clue as to whether or not the true pelvis is of normal size. (See chapter on Examinations.)

The true pelvis consists of—

Inlet, or brim,
Cavity, and
Outlet.

The *inlet* should have the following dimensions:

From front to back (true conjugate diameter) should be $4\frac{1}{4}$ inches.

From side to side (transverse diameter) should be $5\frac{1}{4}$ inches.

From the right side behind to the left side in front (right oblique diameter) should be $4\frac{3}{4}$ inches, and from left side behind to right side in front (left oblique diameter) should also be $4\frac{3}{4}$ inches.

The *cavity* is the part of the true pelvis which lies between the inlet above and the outlet below. On looking into it, it will be seen to be somewhat like the socket into which a screw fits, and it is this screw-like shape which favours internal rotation of the head of the child, which, as it passes through the pelvis, goes through much the same kind of movement as does a screw when it is being driven into a hole.

The cavity is shallower in front than behind; hence the central path through it (axis of the pelvis) is a somewhat C-shaped line, being directed downwards and backwards from the brim, and then upwards and forwards towards the outlet. It is for this reason that in expressing the placenta, etc., pressure is made in a downward and backward direction, and in extracting children born by the breech the body is brought upwards and forwards.

The *outlet* is lozenge-shaped, being bounded in front by the pubes, behind by the tip of the coccyx, and at the sides by the great ligaments which bind the bones together, the tubera ischii, and the pubic arch. Its longest diameter is from before backwards, and this is

capable of further elongation by the tilting backward of the coccyx which occurs during the passage of the head; hence it is in this diameter that the long axis of the fœtal head emerges at birth.

Joints.—Besides junctions between different parts of the bones mentioned above (which, when development is complete, are firm and immovable), there are four joints between the four bones which form the pelvis. These are:

The sacro-iliac joints, one on either side, between the sacrum and the ilium. The bony surfaces are covered by cartilage, to prevent jarring and grating during movement, and the bones are firmly bound together by strong fibrous bands called ligaments. Within each joint is a chink, which during pregnancy becomes a cavity; the ligaments also at the same time soften and stretch, and thus during the passage of the head at birth an additional ½ inch of room is afforded on either side of the pelvis; also the sacrum is enabled to tilt a little backwards at the top when the head is entering the brim, and at the bottom when it is passing out.

The sacro-coccygeal joint is that between sacrum and coccyx; it is movable, and during parturition the coccyx tilts backwards, affording an additional inch of room at the outlet.

The symphysis pubis is the joint between the two pubic bones; it lies in the mid-line in front, and can also develop a cavity in its interior, which increases the room available for the passage of the head.

The hip-joints lie quite near, though outside the

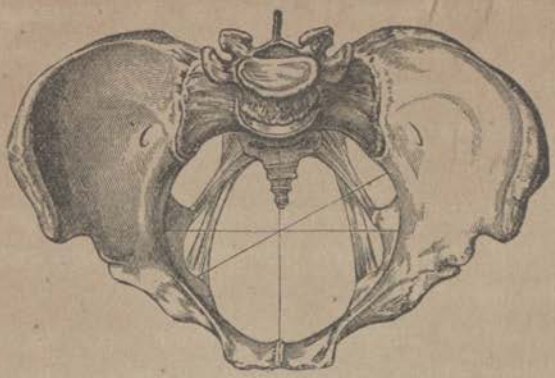

FIG. 1.—FEMALE PELVIS, VIEWED IN THE AXIS OF THE BRIM. (Galabin's 'Midwifery.')

Antero-posterior or conjugate, transverse, and oblique diameters are marked.

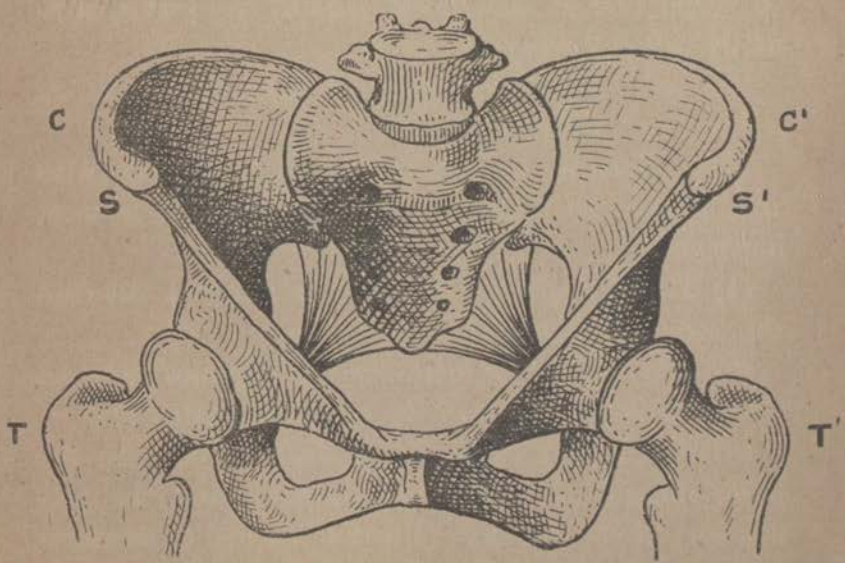

FIG. 2.—FRONT VIEW OF THE PELVIS. (Jellett's 'Manual of Midwifery.')

C C', Iliac crests; S S', anterior superior iliac spines; T T', great trochanters.

pelvis, and as disease of these is apt to cause pelvic deformity, medical advice should always be sought in cases of old or recent hip-joint disease.

Bony points which the midwife must learn and remember :

The promontory of the sacrum is the most prominent part of that bone, which juts forwards and encroaches upon the pelvic inlet.

The anterior superior iliac spines are small bony prominences which lie at the outer ends of the junction of thigh with abdomen. To them are attached Poupart's ligaments, which pass from the anterior superior spines to the pubis, and form a dividing-line between thigh and abdomen.

The iliac crests are the bony ridges which are found on either side at the widest part of the pelvis, ordinarily called the haunch-bones.

The spines of the ischium and the *tuber ischii* on either side. (See diagram.)

Three *diameters* the midwife must be familiar with and be able to measure; of these the last is most important :

(1) The *interspinous* diameter or distance between the two anterior superior iliac spines ;

(2) The *intercristal* diameter, or distance between the most distant parts of the two iliac crests ; and

(3) The *oblique conjugate*, or distance between the lower margin of the symphysis pubis and the promontory of the sacrum. (For the method of measurement, see chapter on Examinations.) The bony pelvis is clothed inside and out with muscles, upon and

amongst which lie the bloodvessels and nerves for the pelvic organs, also other vessels and nerves which pass through the pelvis on their way to the lower limbs. These latter get pressed upon during pregnancy and labour, with resulting cramp in the legs and hindrance to the return of blood by the veins to the heart; this pressure increases any tendency in the woman to varicose veins of the legs and rectum (hæmorrhoids).

The outlet of the pelvis is partly closed by a fibro-muscular shelf (the pelvic floor), which passes inward from the side walls of the pelvis, to meet at a point which lies between the rectum behind and the vagina in front, and is called the central point of the perinæum. Into this point also are inserted the muscles which close the openings of the rectum and vagina, and from it to the skin passes a firm wedge-shaped mass of fibrous tissue, the perinæum proper, which lies between the back and front passages, and helps the parts to resist the strain put upon them during parturition.

It is the contraction of this muscular pelvic floor which, when the head reaches it, presses it forward, causing extension and birth.

The floor is pierced by three openings:

The urethra in front,
The vagina in the middle, and
The rectum behind.

THE EXTERNAL GENITALS.—These consist of the mons veneris (the cushion of fat, covered with skin

which lies over the pubes) and the structures lying in the natal cleft. These are the *greater lips*, or labia majora, two thick folds of skin, covered with hair, the *lesser lips* lying between them.

The *vestibule*, a triangular area lying between the lesser lips and in front of the genital opening, having at its apex the *clitoris*, and about the middle of its floor the *urethral orifice*, which leads into the bladder.

Behind this is the *vaginal orifice*, partly closing which, in the virgin, is the *hymen*.

Behind, again, is the *fourchette*, and then the *perinæum*, which separates the vagina from the rectal opening, or *anus*.

. The INTERNAL GENITALS are the—

Uterus,
Fallopian tubes, and
Ovaries.

The passage leading from the external to the internal organs is the vagina. The uterus is a hollow, pear-shaped organ, about 3 inches long by 2 inches broad, and $1\frac{1}{2}$ inches thick, which lies in the pelvis between the bladder in front and the rectum behind. It leans somewhat forward when the body is in the standing posture, and rests against the pubes, the latter being placed almost horizontally when the woman stands upright.

From the upper part of the uterus spring two horn-like arms, one on either side; these are the Fallopian [illegible] they curve backwards, and lie at the sides of [illegible] Cl[illegible]o these are the ovaries, two glands

FIG. 3.—THE VULVA. (Sharpey.)

a, Labia majora ; *b*, labia minora ; *c*, meatus urinarius ; *d*, glans clitoridis ; *e*, clitoris ; *f*, mons veneris.

each about the size and shape of a walnut in its shell, whose duty it is to manufacture the ova, or female germ-cells.

Lining the abdomen, and covering the organs contained in it and the pelvis, is a membrane called the peritoneum; it forms slings, which keep the various organs in position. The part of this membrane which lies within the pelvis is called the pelvic peritoneum; it comes down from the front wall of the abdomen, and passes over the upper part of the bladder and uterus. Passing outward at the sides, over the Fallopian tubes (here it forms what is called the broad ligament), it dips down into a hollow between uterus and rectum (pouch of Douglas), and passes up over the back wall of the pelvis to reach the abdomen again.

Inflammation of this membrane constitutes peritonitis.

Between the double fold of peritoneum which forms the broad ligament on either side is a space containing much loose tissue; inflammation of this is known as parametritis, and when pus forms there the condition is known as pelvic abscess.

Structure of the Uterus.—The main bulk of the uterus is made up of muscle, the strands of which are arranged in several layers, which interlace and cross each other in different directions. The bloodvessels lie between the muscle fibres, and their complex arrangement both renders the wall of the uterus stronger than it would otherwise be, and also provides the necessary mechanism for compressing and closing the bloodvessels after emptying of the uterus, which otherwise would

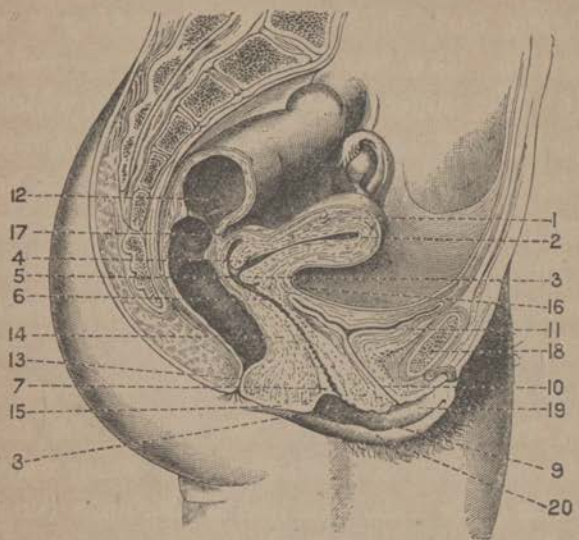

FIG. 4.—VERTICAL SECTION OF THE PELVIS IN THE VIRGIN.
(Galabin's 'Midwifery.')

1, Body of uterus; 2, its cavity; 3, the vaginal portion; 4, canal of cervix; 5, lower lip of os externum, forming apex of anterior triangle; 6, vagina; 7, hymen, forming apex of posterior triangle; 8, fourchette; 9, fossa navicularis; 10, urethra; 11, bladder, empty and relaxed; 12, rectum; 13, anus; 14, recto-vaginal septum; 15, perinæum; 16, vesico-uterine fossa of peritoneum; 17, pouch of Douglas; 18, os pubis; 19, labium minus; 20, labium majus.

bleed profusely. The uterine cavity is lined with mucous membrane. The outer surface of the organ is partly covered by the peritoneum.

The uterus consists of *neck*, *body*, and *fundus*.

The *neck* (or cervix) is the part which projects into the vagina, and which is felt on making a vaginal examination; its entrance is called the *external os* (or mouth). The upper opening of the neck, which leads into the body of the uterus, is called the *internal os*.

The body of the uterus is the part which lies between the neck and the openings of the Fallopian tubes.

The *fundus* is the curved portion which lies above the openings of the Fallopian tubes. (See diagram.)

OVULATION.—Numbers of immature eggs are contained in the ovaries; from time to time these become mature, and are shed from the ovary, the shedding being termed *ovulation* and the eggs being called *ova*. About the same time the uterus becomes congested; the surface portion of its lining is shed and blood poured out (*menstruation*). The newly shed ovum is taken into the Fallopian tube, and sent along it (by the sweeping action of the living brush-work with which the tube is lined) into the uterus, where, if it has been fertilized, it adheres to the moist uterine wall, and begins to develop into a fœtus. Non-fertilized ova escape with the menstrual blood and are lost.

Sometimes a fertilized ovum fails to reach the uterus, having been arrested in the tube or elsewhere, and there settling down to undergo development; this results in extra-uterine pregnancy, or the development of a fœtus in some abnormal situation. The condition

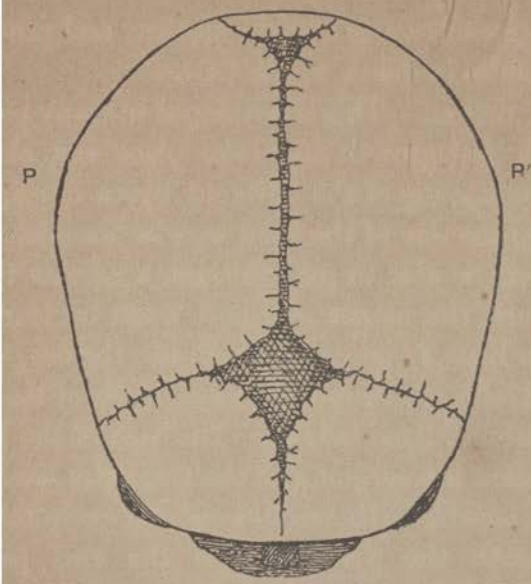

FIG. 5.—THE FŒTAL SKULL SEEN FROM ABOVE.
(Jellett's 'Manual of Midwifery.')

P P', Biparietal diameter.

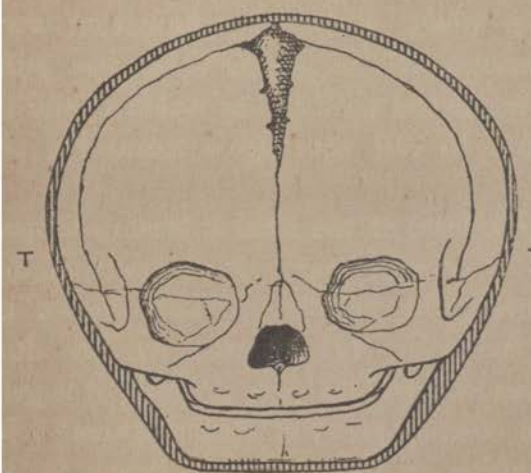

FIG. 6.—THE FŒTAL SKULL SEEN FROM IN FRONT.
(Jellett's 'Manual of Midwifery.')

T T', Bitemporal diameter.

is one of greatest danger to the mother, and practically always results in death to the fœtus.

Fœtal Skull.—This is developed in many pieces, in order both that growth may take place and also that by the overlapping of the different bones during birth (moulding) the size of the head may be diminished, and a large head be able to pass through a narrow tunnel.

The bones, the names of which must be learnt, are the *frontal* bone, forming the forehead; the *two parietals* (right and left), which form the side walls of the head; and the *occipital* bone behind. The back of the head is usually called the *occiput* and the front the *sinciput*.

During normal birth the frontal and occipital bones slide beneath the parietals and the two parietals overlap each other, thus diminishing the length and breadth of the head.

Fontanelles.—Two gaps are found in the skull of the newly born infant, where bony formation has fallen short; through the larger of these the pulsations occurring inside the skull can be watched, and this led the ancients to call the gap a fontanelle, or little fountain.

The gap in front of the head is lozenge-shaped, and called the *anterior fontanelle*, in contradistinction to a smaller, triangular junction behind, known as the *posterior fontanelle*. (The latter, as felt during a vaginal examination, is seldom a 'gap'; it is generally merely the meeting-point of three sutures.) It is by the recognition of these by the finger in vaginal examination that one is able to know which part of the head is presenting.

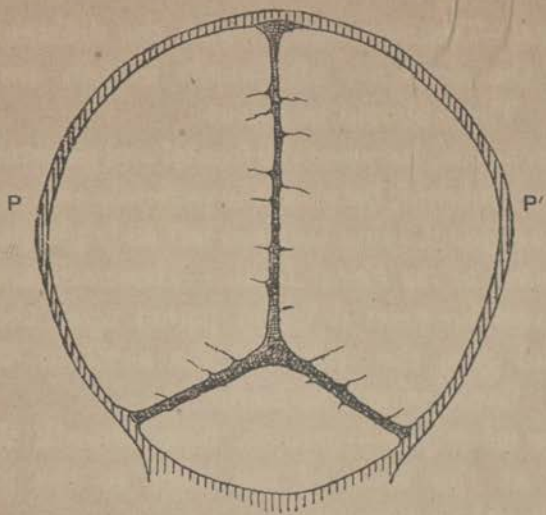

FIG. 7.—THE FŒTAL SKULL SEEN FROM BEHIND.
(Jellett's 'Manual of Midwifery.')

P P', Biparietal diameter.

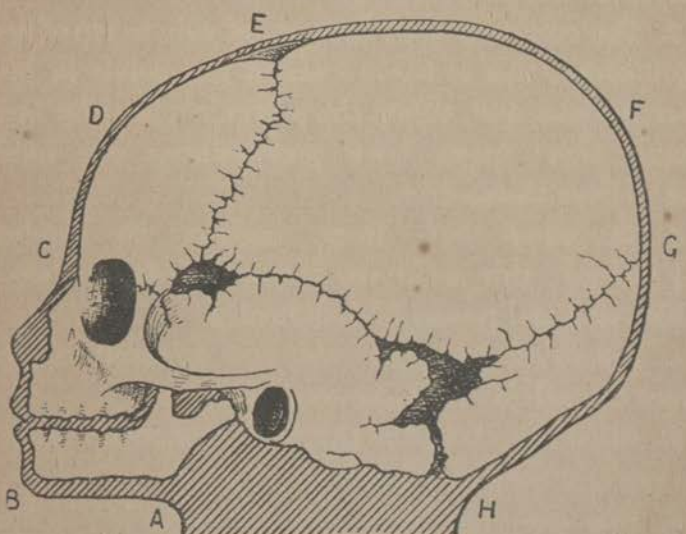

FIG. 8.—THE FŒTAL SKULL SEEN FROM THE SIDE, SHOWING DIAMETERS.
(Jellett's 'Manual of Midwifery.')

A E, Cervico-bregmatic diameter; B D, fronto-mental diameter; B F, supra-occipito-mental diameter; B G, occipito-mental diameter; C G, occipito-frontal diameter; D H, sub-occipitofrontal diameter; E H, suboccipito-bregmatic diameter.

Sutures.—The lines along which the different bones forming the skull are afterwards to join are called sutures. Three should be learnt:

1. The *coronal*, between the frontal and parietal bones.
2. The *lambdoid*, between the parietals and occipital.
3. The *sagittal*, lying between left and right parietals.

Diameters of the Fœtal Head.—These are imaginary lines drawn between different points upon the fœtal skull, and give the width of the skull in different regions. Seven should be learnt:

1. The *suboccipito-bregmatic*, from beneath the prominence at the back of the head to the anterior fontanelle ($3\frac{1}{2}$ to 4 inches).

This diameter lies across the pelvis in ordinary vertex deliveries and passes easily.

2. The *vertico-mental*, from tip of chin to top of head ($5\frac{1}{4}$ inches); this is thrown across the pelvis in brow presentations, and, unless the pelvis is unusually large, cannot pass: hence brow presentations can hardly ever deliver themselves.

3. *Occipito-frontal*, from occiput to forehead ($4\frac{1}{2}$ inches); this is thrown across the pelvis in face-to-pubis cases and passes with difficulty.

4. *Fronto-mental*, from chin to forehead, thrown across the pelvis in face presentation.

5. *Biparietal*, between the most prominent parts of the parietal bones ($3\frac{1}{2}$ inches).

6. *Bitemporal*, between temporal bones ($3\frac{1}{4}$ inches).

7. *Bimastoid*, between the bony masses which lie just behind the ears ($2\frac{1}{4}$ to $2\frac{3}{4}$ inches).

(The lengths of diameters given are averages.)

CHAPTER III

PUERPERAL SEPSIS

THE word 'sepsis' denotes putrefaction, and the septic condition is one of blood-poisoning, brought about by the presence in the body of numbers of minute living creatures, known as germs of disease.

As illness of various kinds is so common amongst us, the germs of disease are universally present. The dust of the room contains numbers of them; the skin of our hands is rarely free from them; and our saliva, breath, and almost everything we touch, are contaminated with them; but they are so small that we cannot see them, except by the aid of a microscope. They are of vegetable nature, and require for their growth conditions similar to those necessary for other forms of plant life, except that, as they contain no green colouring matter, they need no light. Light is, indeed, to them a serious disadvantage, preventing growth, and in some cases causing their death; hence one of the great uses of light in keeping people healthy.

Conditions required by germs are:

1. Moisture.

2. Warmth (the normal temperature of the body, 98·4° F., being most favourable).

3. Suitable food material.

These conditions are found in perfection in the genital passages and discharges of the newly delivered woman, and this, taken with the fact that she has recently passed through a severe strain, and is therefore in a condition of lowered vitality, accounts for her special liability to suffer from blood-poisoning if germs are given an entrance. These little bodies have a wonderful power of reproduction; they increase by splitting into two, each half rapidly becoming a complete germ. They can in favourable circumstances become great-grandparents in the space of an hour, and, unless killed by outside agencies, are, as someone has said, immortal, the life of the parents being carried on through an infinite number of descendants; hence the smallest particle of material containing them is enough, if brought into contact with a raw surface, to produce the mischief. Nearly all acute diseases are due to the presence of some one or other variety of these germs. Often two or more kinds are present at the same time, and several kinds have the power of producing blood-poisoning in lying-in women.

Amongst the commonest found are the following, and it is infinitely more important to remember where they occur than to know their names:

1. *Streptococci* are little round germs which grow in long chains; these are found in cases of—

Erysipelas and cellulitis;
Scarlet fever;
Peritonitis;
Other cases of puerperal sepsis; and
About the skin of the dying and dead.

Hence the great danger of attending midwifery cases after being in contact with any such, unless a very thorough disinfection has been carried out.

Similar germs, though in a less virulent form, also exist in saliva, street dust, and manure—both animal and human. When infected with streptococci, the patient is apt to suffer from the most virulent and fatal form of blood-poisoning.

2. *Staphylococci*, found in boils, abscesses, whitlows, any unhealthy condition of the skin, throat, or teeth—for example, the yellow eruption found about the face in unhealthy and dirty children, quinsy, gumboil, etc.; also in suppurative inflammation of bone and ulcers of the legs. The nurse who either herself suffers from or who attends patients suffering from such ailments must not at the same time attend lying-in women, on account of the grave risk to her patients from infection.

3. *Bacillus Coli Communis.*—This germ is found in millions in the intestine, and the smallest particle of fæces contains it; hence the rule that swabbing of the genitals must always be done from before backwards, lest any such material should be washed from the rectum into the vagina and contaminate the genital passage; also that the same swab must never be used twice.

The old practice of using a common syringe for both enema and douche giving (which seems still to obtain in some places, despite six years' administration of the Midwives Act) owes its danger to the fact that fæcal matter passes backward from the rectum into

the bulb of the syringe, and is, when the latter is used for douching, apt to be squirted into the vagina.

The new issue of C.M.B. rules is very clear as to the need for two separate pieces of apparatus for these two purposes, and there is no excuse for the nurse who, by carelessness in this matter, risks the lives of those who trust themselves to her care.

Complete perinæal lacerations are also additionally disastrous on account of the danger of fæcal contamination of the genital passage.

4. With the above germs the *pneumococcus* is often associated. It is the germ which causes pneumonia, and is often also present in chronic inflammation of the inner corner of the eyes in middle-aged people, and this is probably the source of infection—the midwife touching her eyes, and the germ lurking about her fingers.

5. The *gonococcus* has been believed to be a cause of puerperal septicæmia, but it is much more apt to set up chronic pelvic trouble, with matting together of tissues, displacement of the uterus, and prolonged invalidism, than the more acute form.

It is present in unclean vaginal discharge, and, where such is found, extreme care should be taken to remove as much of it as possible from vagina and vulva shortly before the passage of the child's head. This is to be done in the interests of both mother and child, as the germ is the cause of the specific inflammation of the eyes of the newly born known as *ophthalmia neonatorum*.

Three conditions are usually present when puerperal sepsis occurs:

1. *A General Predisposition; i.e.*, some condition which lowers the woman's power of resistance—*e.g.*, some constitutional disease. Impaired nutrition, due to indigestion, insufficient food, alcoholic excess, etc. Overwork, or lack of sleep. Unhealthy surroundings, as, for example, the constant breathing of impure air, whether in small, ill-ventilated rooms, or polluted by drain-gas, coal-gas, or some other source of offence. Exhaustion of the strength by prolonged or complicated labour, loss of blood, etc.

2. *A Local Predisposition—e.g.*, bruising of tissues by prolonged pressure; lacerations of the cervix, vagina, or perinæum, which open up doors of entry for the germs; the presence of the placental wound.

3. *The Introduction of Germs of Disease.*—Conditions under the second heading are always present, more or less; but those under headings (1) and (3) being absent, most people get over their confinement without sepsis. When, however, any of the first group of conditions are present, more than ordinary care is necessary to prevent the introduction of germs if sepsis is to be avoided.

Vital statistics show that cases of puerperal sepsis are more numerous and more fatal in times of heavy rain following prolonged periods of dry weather. Whether the germs are more plentiful at these times, or whether it is that the damp causes increased depression of the general health, is not clear, but the fact remains that greater care is needed at such seasons.

How are the germs introduced?

By careless examination—*i.e.*, with dirty or infected fingers. (See C.M.B. rules E 1 and preceding paragraphs of this chapter.)

By want of attention to ordinary cleanliness of the genitals, particularly where there are lacerations of the perinæum, labia, etc.

By douching or washing with dirty nozzles, syringes, sponges, etc., or by using impure water for these purposes. Under this heading infection with *Bacillus coli* from the rectum is likely to occur, unless great care is taken.

By dirty pads, diapers, etc., applied to the vulva.

Placental remains, fragments of membrane, or blood-clot, if retained in the uterus, become infected with germs from outside, which find entry to the genital passage, and act as poison manufactories. The poisons are absorbed into the system, and *sapræmia* results; also the germs, growing, as they are, in very favourable surroundings, increase in strength and virulence, and make their way into the blood-stream, producing septicæmia.

Late septic infection is often due to the fact that the patient does not live a single life during the time required for healing of the placental and other genital wounds.

It will thus be seen that puerperal sepsis is in nearly every case preventable, and hospital statistics bear this out, for whereas puerperal fever, as it was called, used to be extremely common in lying-in wards, since surgical cleanliness has been understood and secured

it is very rarely that a case occurs in them. This happy result has not, however, been attained in private work, and to bring it about is one of the main objects of the passing of the Midwives Act.

It will perhaps be well here to explain some of the terms commonly used in speaking of the various conditions included under the general heading 'puerperal sepsis.'

Sapræmia is an intoxication. The patient who suffers from it is being poisoned by substances which are being manufactured by germs which have settled down in some dead or unhealthy tissue about her, such as retained placenta or blood-clot, sloughing perinæum, etc.

The important point in this connection is to insure that at the time of delivery nothing is left behind, and that in those cases where the uterus is weak and lacking in tone, whether from exhaustion, loss of blood, or any other cause, special care is taken to guard against accumulation of blood inside it (by avoidance of excitement, sitting up too early, etc.), and also to secure contraction by massage, antiseptic vaginal douches, and, where necessary, special medicines given for the purpose.

Septicæmia is a condition in which the septic germs are actually in the blood of the patient, and are being carried by it to all parts of her body ; it is the gravest form of blood-poisoning, and is usually fatal. It may occur as the direct result of infection from another case of septicæmia (carried by the hands of the attendant), or, later, as the sequel of untreated sapræmia.

Pyæmia is a condition in which little masses of germs (septic emboli) are carried about in the blood-stream from some septic focus (for example, an inflamed vein) to various parts of the body. When these masses reach a vessel which is too small to allow of their passage onward, they remain in the vessel, blocking it and settling down to form an abscess there. Thus in pyæmia the patient suffers from 'multiple abscesses,' which may be found in almost any situation—*e.g.*, under the skin or in a joint, but perhaps most frequently in the lungs; and this is the real nature of much of the so-called bronchitis which follows confinement, and causes the death of the patient some weeks afterwards: the condition really being a septic pneumonia.

Phlebitis is septic infection of veins. It usually begins in the pelvic veins, having extended to them from an unhealthy uterus; it may involve one or both legs. Sometimes the lymphatic vessels are also affected, and 'white leg' produced.

The way to prevent it is to keep the uterus clean and healthy and to secure natural involution. The condition is much less common than it was, owing to greater cleanliness in the management of labour and the puerperium.

Peritonitis is inflammation of the membrane which lines the abdomen and covers the organs contained in that cavity. It may be general—*i.e.*, affecting all parts of the membrane—or localized in some particular part; in lying-in women it is often confined to the pelvis, and is then known as pelvic peritonitis.

Perimetritis and *parametritis* are words used to denote septic inflammation around and at the sides of the uterus.

Metritis is inflammation of the uterus itself, such as may occur in subinvolution, and *endometritis* is inflammation of the lining of the uterus.

Either of these conditions occurring during or soon after lying-in is infective, and the midwife must not attend it and other lying-in women at the same time; nor may she return to her ordinary work after being in attendance upon such a case until she and her clothes and appliances have been disinfected to the satisfaction of the Local Supervising Authority.

Symptoms and Signs of Sapræmia.

The pulse-rate is increased.

The uterus, if it is the seat of infection, is larger than it should be for the date of confinement, and is often tender on pressure; if the mischief centres around a lacerated perinæum or other wound, the latter is inflamed and sloughy.

Sometimes the lochia are offensive, and sometimes they are pent up inside the uterus.

The temperature rises to 101° or 102° F., and the patient complains of headache and general illness.

Prevention.—The increased pulse-rate and large uterus are early danger-signals, and if these are noted and the case treated at once, the source of unhealthiness can usually be removed before the temperature rises—*i.e.*, before much poison has been manufactured or absorbed—and further trouble prevented.

If the uterus is flabby, it should be made to contract and expel its contents. The correct management of the third stage of labour is the first thing to be careful about, that no remains be left behind; later, if the uterus is sluggish, it can usually be made to contract by massage, preceded, if necessary, by the emptying of bladder and rectum (which latter is comfortably secured by giving 1 ounce of castor oil). If this is not sufficient, a hot vaginal douche (1 teaspoonful of cyllin to a quart of water at 110° F.) will stimulate the uterus and cause the expulsion of clots.

If some other wound is the source of trouble, it must be cleansed. Cases which have been neglected and in which the temperature has been at 100·4° F. for twenty-four hours require medical aid.

Symptoms and Signs of Septicæmia.

There is often a rigor at the onset—*i.e.*, prolonged shivering, accompanied by chattering of the teeth, and a pinched, anxious expression of face, and followed by free perspiration and more or less collapse.

The pulse-rate is increased, often to much above 100 per minute.

The temperature rises to 103° or 104° F., or higher, dropping several degrees within twelve hours or so, and again rising to its former level or above within twenty-four hours. (The septicæmic curve of temperature is characterized by its large waves.) The lochia are sometimes normal, sometimes diminished in quantity, but fœtor (the sign upon which nurses are

apt to lay so much stress, and for which they sometimes wait until the sufferer is beyond aid) is often entirely absent.

The secretion of milk is often stopped or diminished. Diarrhœa may or may not be present. Sometimes there is constipation.

The tongue is usually furred, and the breath very offensive.

Sleep and appetite usually fail, though occasionally the patient asks for substantial food.

Sometimes skin rashes develop, which may be like the rash of scarlet fever, or take the form of large purplish patches about the body.

Aspect.—The patient looks extremely ill: her skin has a dull earthy colour, her cheeks are flushed, her eyes are sunken, and her features pinched.

Symptoms and Signs of General Peritonitis.

The ordinary signs of fever are usually present—*i.e.*, high temperature, increased pulse frequency, rigor, etc. —but in some of the worst cases there is a subnormal temperature.

There is also very severe abdominal pain and tenderness, with distension. The patient lies in bed, with an intensely pained expression; her knees are drawn up to relax the muscles of the abdominal wall. She breathes wholly from the chest, keeping the abdomen quite still and rigid, as the slightest movement increases the pain. She is usually constipated, but there may be offensive diarrhœa, and hiccough, a very painful symptom, is sometimes present.

In *pelvic peritonitis* the pain, tenderness, and rigidity are localized at the lower part of the abdomen and pelvis. There are also the general symptoms and signs of fever, as mentioned above.

The symptoms and signs of septic infection of the veins come on later, usually after the tenth day, sometimes in the third week. There is a rise of temperature (which may be as high as 104° to 106° F.), sometimes preceded by a rigor; the leg (usually the left at first, and perhaps later also the right) becomes swollen, painful, and tender, with thickening along the course of the veins; varicose veins especially become inflamed and knotty, and exceedingly tender. If the lymphatics also are involved, as in 'white leg,' the leg becomes tense, white, and shiny.

The important thing to do is to keep the leg *absolutely at rest* until medical aid arrives. The foot should be gently raised, and a pillow placed under it to elevate it slightly; it is well to spread a sheet of cotton-wool over the leg to protect it from the hands of sympathetic friends, whose first kindly but utterly mistaken idea will be to rub it, a proceeding which is likely to cost the patient her life. The weight of the bedclothes should be taken off the limb by some form of bed-cradle, which can readily be improvised with the aid of a bandbox or kitchen stool. During the nursing the patient must be kept strictly in bed, and no movement of the leg allowed.

The great danger in these cases is that a part of the clot which forms inside the inflamed vein may be

detached, and be carried about the circulation. If a large clot is thus broken off, it is carried by the blood-stream to the heart, where, if large enough, it stops the heart's action and causes sudden death from heart failure. If the clot is somewhat smaller, it passes through the heart into the great bloodvessel which supplies the lungs ; this vessel divides into two branches, one for each lung, and the clot has a way of fixing itself just at the place of division, thus blocking both branches and preventing any blood entering either lung; this causes sudden death from asphyxia. If the clot is smaller still, parts of the lung are cut off from their blood-supply and rendered useless ; and if, as often happens, the clot breaks up into fragments, these become impacted in the vessels to different parts of the lungs, and, being septic, set up an abscess wherever they lodge, with the result that septic pneumonia is produced, as mentioned above. Any movement of the patient favours detachment of clot from the inflamed veins ; hence the need for absolute stillness in this condition.

CHAPTER IV

ANTISEPTICS

THE French chemist Pasteur, by patient investigation with the microscope and other methods, discovered that germs were the cause of such diseases as blood-poisoning, and our own Lord Lister found out a way of killing the germs and protecting wounds from infection by them.

Any agent which wages war against the germs of disease is called an antiseptic. Septic means infected with germs of disease. Sepsis means the state of being infected, and asepsis means without infection. A disinfectant is an agent which will destroy infection.

Natural disinfectants are:

Light,
Heat,
Air.

Few, if any, germs of disease can for long survive exposure to bright sunlight; the brighter the light, the greater is its power of killing germs: hence the need for large windows, the drawing back of curtains, etc., in order that as much light as possible may be admitted into the house, and especially into sick-rooms.

Heat.—Prolonged boiling will kill any germs, but it is important that the things to be disinfected should actually be boiled, and not simply that hot water be poured upon them, for this is insufficient to sterilize or render them germ-free.

Air.—Not only is infection blown away by fresh air, but the oxygen which the air contains has the power of directly killing several kinds of germs; also, fresh air builds up the resisting power of the individual, and helps him to make a successful fight when attacked by germs of disease. For all these reasons, fresh air is one of Nature's best weapons against infection.

In addition, however, to these natural disinfectants, it is necessary, in dealing with the sick or wounded, to use special drugs or other substances which have the power of killing the germs actually present, or, at least, of preventing their growth and increase. This is particularly important in densely populated areas, like large cities and towns, where, not only are the germs of disease more numerous than in the country, but the people, living as they do under adverse conditions, have less power of resistance. Since the discoveries of Pasteur and Lister wonderful things have been possible in surgery which could not have been attempted in the old days. Lying-in women, too, have reaped enormous benefits, and it is in order that these benefits may be extended to the very poorest lying-in woman that the C.M.B. has made its very strict rules that midwives must carry and use suitable antiseptics whenever they attend patients. It is the

genital region that is important in this connection; here the tissues are damaged, here is the placental wound, and here it is easy for infection to occur: hence the law obliges the midwife to cleanse and disinfect her hands and arms *on every occasion* before touching the genitals.

One of the best antiseptics for disinfecting the hands is perchloride of mercury, 1 part in 1,000 parts of water for ordinary use, and twice this strength after attendance upon a septic case. The action of the antiseptic is stronger if the skin is first swabbed with methylated spirit, and this should be done before putting the hands into the perchloride lotion when they have touched anything specially infectious.

No amount of antiseptic precaution will do away with the need for ordinary cleanliness: so, in the first instance, the hands and arms must be thoroughly cleansed with soap and water, the nails being always kept short; next, the soap must be rinsed off with clean water, for otherwise it would render the antiseptic ineffective; then the hands must be soaked and the arms rinsed with the perchloride solution for several minutes.

It must be remembered that perchloride of mercury is a deadly poison, and on no account should lotions or tabloids be left about.

A suitable antiseptic for swabbing the genitals is cyllin, 1 drachm to the quart of water. Lysol and Izal in the same strength are also good: these preparations have also the advantage that they are not decomposed by soap, besides which, although they are very

poisonous to germs of disease, they have rarely been known to produce poisoning in the human subject.

There are many other preparations upon the market made in imitation of these reliable antiseptics, which, on analysis, are found to contain little, if any, of the antiseptic principles, and which experiment has shown to have scarcely any value in preventing the growth of germs; these are not efficient antiseptics, and should therefore be avoided.

For douching the vagina, when necessary, cyllin, lysol, and Izal are all suitable in the strength mentioned above.

Carbolic acid and perchloride of mercury are to be avoided for this purpose, unless used under the supervision or at the order of a doctor, for they are apt to produce symptoms of poisoning.

Carbolic acid or lysol are very good for the soaking of instruments, and do not destroy their brightness, which perchloride of mercury does; but carbolic acid solution has a sweet taste, which has led to its being drunk by children and others; indeed, at one time it was one of the commonest causes of accidental poisoning, and, for this reason, has fallen into disuse so far as midwifery practice is concerned.

Tincture of iodine is a very good antiseptic for douching (1 drachm to 1 pint of water); but it is expensive, and therefore rarely used by midwives.

Permanganate of potash was at one time very much used by midwives, but, in the weak solution usually employed, it has scarcely any antiseptic action, and

therefore cannot be considered efficient; it is good, however, as a deodorant—*i.e.*, a destroyer of bad smells.

For disinfecting utensils crude cyllin is excellent—a cheaper kind than that used about the patient. A little of it mixed with hot water should be put into the utensil before use, and should also be used in the cleansing afterwards.

Iodoform is an excellent antiseptic for sprinkling upon little wounds about the genitals, and also for an unhealthy navel. A very good plan is to keep the iodoform in a clean bicycle oil-can, from which it can readily be squirted out when required.

For powdering the umbilicus and skin of the infant some antiseptic should be used, and for this few things are better than a mixture of boracic acid, starch, and oxide of zinc in equal proportions, all finely powdered. Boracic acid alone is sometimes used, but is objectionable, inasmuch as it is apt to cause irritation and reddening of the skin. Fuller's earth should be avoided, as it is likely to contain the germ which causes tetanus (lockjaw).

For the infant's eyes boracic acid, in half-saturated solution, is the safest thing the midwife can use, and, except in infective cases, is quite sufficient. In those instances in which the mother has suffered from a foul vaginal discharge the infant's eyes should, after the lids have been cleansed, be treated with perchloride of mercury lotion (1 in 4,000). To prepare this a tablespoonful of the clean lotion (1 in 1,000) prepared for the hands may be taken, mixed with 3 tablespoonfuls

of clean water, covered, and set aside until required for use.

For soaking feeding-bottles boracic acid is also a suitable antiseptic.

To prepare boracic lotion a teaspoonful of the crystals should be put into a clean medicine-bottle, and the latter filled with water which has been boiled; the water will take up as much of the acid as it can hold, and as long as any crystals remain at the bottom the lotion remains saturated. When required for use this strong lotion should be mixed with an equal quantity of hot water, and used warm.

For cracked nipples Friar's Balsam (compound tincture of benzoin) is the best antiseptic; it not only disinfects the crack, but, by forming a film over the wounded part, prevents further infection.

Lubricants upon the examining finger are best avoided, except in special cases, but it is wise always to carry one in case of need. The best form of package for it is the screw-stoppered tube, which, when its stopper is removed, exposes but a very small surface to the foul air of the sick-room, and does not permit insertion of the fingers, thus keeping the main bulk of the lubricant pure. If carried in an open pot the surface soon becomes polluted, and the material is no longer fit for vaginal use.

Biniodide of mercury mixed with boiled soap or with vaseline is to be bought in screw-stoppered tubes, and either preparation is good.

It is also advisable to carry a small pot of carbolized vaseline. This is useful for anointing the skin around

the anus before action of the bowels. A thick wall of it put between anus and vagina limits soiling of the perinæum and renders cleansing easier. The pot should be of small size, and cleansed after every case, the stock of vaseline being kept elsewhere.

A little tannic acid is useful in the treatment of moist navels. Boracic ointment, freshly prepared, forms a good application for the infant's head when the skin is unhealthy or scaly.

CHAPTER V

EXAMINATION

EVERY midwife should develop to the utmost her capabilities in this direction—her powers of observation, sense of touch, and capacity for rightly interpreting the impressions which she receives from her eyes and hands. Very many more mistakes are made from want of ascertaining the exact condition present in any given case than from want of knowledge of the requisite treatment. First, the patient's aspect, complexion, figure, and manner of standing and walking should be observed, mental note being made of the presence of healthy colour, pallor, flushed appearance, blueness of lips or cheeks, puffiness, etc. A dwarfish figure, lameness, or curvature of the spine, should also be noted, if present. Before undertaking the charge of a primipara in her confinement, the midwife should take an opportunity of calling upon her at her home, and examining her, if possible, before the completion of the seventh month of pregnancy, in order that she may ascertain whether or not the woman's pelvis is of normal size and shape; so that, if this be not the case, there may be time to arrange the best means of securing safe delivery in hospital or elsewhere, after

medical consultation. A woman who has borne living children at term may be assumed to be sufficiently well developed; but the primipara is an unknown quantity in this respect until she has been examined, and it is a terrible thing, and one by no means unknown, for the person in charge to find out that her pelvis is too small to allow of the birth of a living child only after the patient's strength has been exhausted by a long and fruitless labour. In such cases the best possible skill is often powerless to prevent the death of both mother and child.

External examination should in all cases be made; it is painless, attended by no danger, and by it alone the skilful examiner can find out nearly all she wants to know. *Internal examination*, on the other hand, is always accompanied by a risk that something septic may be introduced into the genital passage. This risk can, and should be, reduced to a minimum by scrupulous cleanliness and the use of antiseptics; but it is well to limit the number of internal examinations to about two in normal cases—one soon after arrival, to ascertain the exact state of affairs, and a second made after the escape of the liquor amnii, to find out whether any alteration has occurred, and whether a limb or a loop of cord has been washed down by the gush of water. In order that two examinations may suffice, the midwife must, before inserting her fingers, have in her mind a list of the things which she wishes to ascertain, and must go over all the items before withdrawing the fingers.

In the case of a primipara the midwife should at

her preliminary visit make both an external and internal examination, and if unable to satisfy herself that the pelvis is normal, should advise the patient to get a medical opinion upon this point.

For the external examination, the bladder and rectum having been emptied, the patient should lie upon her back in bed, with her head resting comfortably upon pillows, her knees drawn up to relax the abdominal walls, and her feet and legs covered.

The midwife's hands should be warmed, and she should win the patient's confidence and put her at ease before beginning.

The midwife should then use her eyes, and note the general size and shape of the abdomen, any overdistension or undue flabbiness, any swellings besides the pregnant uterus, as, for example, a rupture (hernia). Ruptures are commonest at the navel and upper parts of thighs or groins.

Any varicose veins of abdomen, thighs, or vulva.

Any swellings about the vulva.

Any general or localized puffiness.

If rupture is suspected, or if the abdomen is very flabby, the patient should be asked to stand, as in the standing position hernia is more obvious than when lying down; also pendulous abdomen, if present, is readily seen.

The hands are next used. The fingers are placed upon the iliac crests on either side, and the thumbs upon the anterior superior iliac spines, and the distance between these estimated. The spines should be at least 10 inches apart, and the crests $10\frac{3}{4}$ to 11 inches.

If this is reversed, the spines being farther apart than the crests, it suggests that the pelvis is flattened; and if the distances are less than those mentioned above, general contraction of the pelvis should be suspected. These measurements can conveniently be taken with calipers, but it is well to train the hands and eyes in the matter, as calipers are not always at hand.

The uterine swelling should be next examined, and its height in the abdomen will tell how far pregnancy has advanced. Before the end of the fourth month the uterus is wholly within the pelvis, and cannot be felt above the pubes; by the end of the sixth month it has reached the navel; at the end of the eighth month it is nearly as high as the tip of the breast-bone; while after this it tends to sink somewhat, on account of the settling into the pelvis of the presenting part.

The upper and lower ends of the oval figure formed by the pregnant uterus are known as the poles; thus the area to be examined consists of the fundal pole above, the pelvic pole below, and the intermediate equatorial region; these must each in turn be examined.

1. To examine the *fundal pole* the midwife stands at one side, facing the patient, and lays her warm hands flat upon the abdomen—at first lightly, but with a gradually increasing pressure; at the same time she presses the hands somewhat towards each other, and tries to get whatever lies beneath between the hands. In this way she is able to estimate the size, shape, and consistency of the part of the child which lies at the fundal pole. If the head is there it will be

FIG. 9.—ABDOMINAL PALPATION: THE UMBILICAL GRIP.
(Jellett's 'Manual of Midwifery.')

felt as a hard rounded body, which can be slightly moved from side to side independently of the body of the fœtus. The width of the head can be ascertained from the distance between the hands when they enclose the head; the consistence of the head can also be made out, and a hint obtained as to the presence or absence of hydrocephalus or of a large head.

Again, if the breech occupies the fundal pole, it will be felt as a softer rounded swelling above, which is continuous with the back below and cannot be moved independently of the body.

All pressing of finger-tips into the walls must be avoided, as this would cause the patient to contract her muscles and become so stiff and rigid that nothing further could be made out.

2. Having examined the fundal pole, the midwife should next turn herself round, face the patient's feet, and examine the *pelvic pole*. Here also the hands should first be lightly laid flat upon the part just above the pelvic bones, and pressure increased in a downward and backward direction, in order to get the presenting part between the hands. By the characters given above the head will be distinguished from the breech, and if it is present at the pelvic pole, it should be gently pushed farther into the pelvis, to see if it has room enough to enter. Here the midwife will note whether or not the smooth curve of the back of the child's head is in front. If so, the position is dorso-anterior—it is a first or second vertex presentation; if not, the chin should be felt for to one side in front. If it is found, the child is lying in the dorso-posterior

FIG. 10.—ABDOMINAL PALPATION: THE FIRST PELVIC GRIP.
(Jellett's 'Manual of Midwifery.')

position, and it must be ascertained whether vertex, brow, or face is presenting. The signs of these are given in the chapter on Dorso-Posterior Positions.

3. *The equatorial region* must next receive attention. One hand should be laid upon the middle of the abdomen and moved from side to side, at the same time that its pressure is being increased, in order that the child may be displaced to one side and the liquor amnii to the other; the other hand is then placed first on one side and then on the other of the abdomen, and pressed towards the hand lying still upon the middle. At the side towards which the child lies a solid body will be felt between the hands, but on the other side the sense of an elastic swelling (the liquor amnii contained within the membranes) will be communicated to the hand. Having thus found out to which side the child is lying, it is necessary to ascertain whether the back or front of it is turned forwards. If it is the back, the hand will feel a smooth curve, which can be traced to the breech at one pole and to the neck at the other; but if it is the front, knobs corresponding to the knees and elbows will be felt near the umbilicus. During the examination an opinion is being built up in the mind of the midwife as to the position of the child, and each step should confirm what went before. If, on the contrary, what she finds at any step contradicts previous findings, she must repeat previous steps, or in some way account for the discrepancy: *e.g.*, a head at both fundal and pelvic poles could only mean twins; but the midwife may have mistaken the breech for another head, and a

FIG. 11.—ABDOMINAL PALPATION: THE SECOND PELVIC GRIP.
(Jellett's 'Manual of Midwifery.')

second examination will either show her her mistake or make her aware of other parts pointing to the presence of a second child, and so on.

All this sounds very long and tedious, but in practice it takes only a few minutes, and the information obtained amply repays the time spent; to be of use, however, the examination must be systematic, thoughtful, and thorough.

Auscultation, or listening to sounds to be heard in the abdomen, is also useful, since to hear the fœtal heart beating is to have proof positive of the presence of a living child. The sound is most clearly heard over the child's back, when the latter is lying in the usual attitude of flexion, and the best place to listen for it is just inside a line drawn from the mother's navel to the middle of the junction of her thigh with the abdomen; in breech presentations the sound is audible above the navel.

The fœtal heart beats at the rate of about 140 per minute, and, when heard, should be counted; rates below 120 per minute or above 160 are unusual. Other sounds which may be mistaken for those of the fœtal heart are the uterine or funic souffle (these have not the clear sharpness of the heart-sounds, and the former keeps time with the mother's pulse, and is therefore slower), and the movement of gases in the mother's intestines.

The external examination completed, the midwife's hands and forearms and the patient's external genitals must be cleansed and disinfected, according to rules E, 3 and 7. While cleansing the genitals the midwife

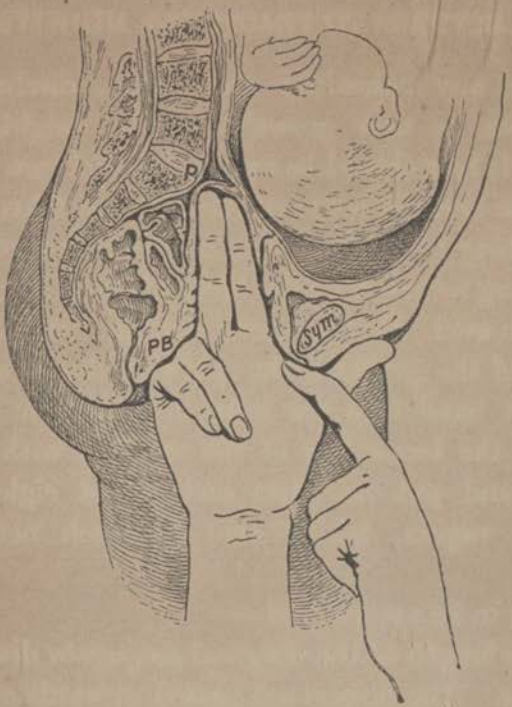

FIG. 12.—MEASUREMENT OF DIAGONAL CONJUGATE. (Galabin's 'Midwifery.')
P = Sacral promonton. PB = Perineal body.

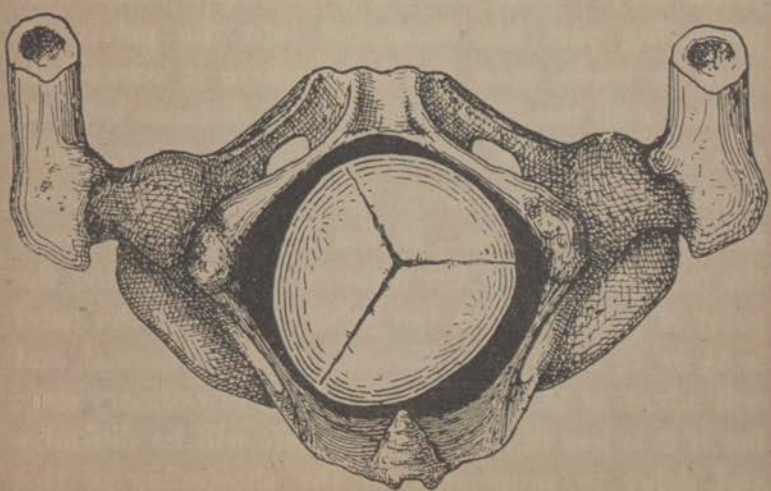

FIG. 13.—FIRST VERTEX PRESENTATION. (Jellett's 'Manual of Midwifery.')
The head after flexion has occurred, as felt by vaginal examination.

will note any unhealthy appearance, discharge, old lacerations, or new growths in the neighbourhood. The pelvic hair should be cut, and special care be taken to cleanse crevices between the different folds of skin, all swabbing being done from before backward, and no swab being returned to the bowl of lotion after having once been used. Having completed the cleansing of her hands and the genitals, the midwife should again dip her right hand into the bowl of antiseptic solution, separate the lesser lips of the opening with her left fingers, and put her first and second right fingers into the vagina, taking care to touch nothing by the way.

Points to be ascertained—

1. The length of the diagonal conjugate diameter of the pelvis. The fingers are passed upwards and backwards, and an attempt is made to touch the sacral promontory. This can only be done before the presenting part has descended into the pelvis. A mark is made upon the hand where it comes into contact with the pubic arch, and the distance between this mark and the tip of the middle finger, which touched the promontory, measured: the distance should be $4\frac{3}{4}$ inches. If the finger fails to reach the promontory, and the distance between it and the point of pressure from the pubic arch upon the hand is $4\frac{1}{2}$ or $4\frac{3}{4}$ inches, the diameter is about normal, and will admit of the passage of a head of ordinary size; but if it is less than $4\frac{1}{2}$ inches, there will be difficulty and delay in proportion to the shortening of this diameter.

This item may be omitted in people who have borne full-term infants, but never in primiparæ.

2. The state of the vagina as regards room, secretion, dryness, heat, swelling, new growths, or any other abnormal condition.

3. The state of the cervix—whether it is thick and soft, and likely to dilate readily, or the reverse of this, the presence of any old rigid scars or new growths which would prevent dilatation.

4. The size of the os, and the amount of stretching which results from a pain.

5. The condition of the membranes—whether ruptured or not; and, if not, the size and shape of the presenting bag; whether or not the cord is presenting or prolapsed.

6. The presentation—whether the normal vertex (in which case the three sutures which meet at the back of the head will be felt in front and towards one side) or some other part presents. The other presentations will be described under their proper headings.

All these points should be in the mind of the midwife before she inserts her fingers, and they should all be gone over before she withdraws them.

If by this examination the midwife has been unable to find out the state of affairs, or if she has found anything amiss, she should lose no time in sending for medical aid, in order that the matter may be put right before the patient gets exhausted or labour is so far advanced that interference becomes needlessly difficult and dangerous. Meanwhile, to lessen the

strength of the pains, the woman should lie upon her side and be told not to strain.

If all is found to be correct, the patient is allowed to get up or directed to lie upon her back, according to the stage of labour reached and the nature of the case.

CHAPTER VI

PREGNANCY

PREGNANCY lasts nine calendar months and one week, or ten months of four weeks each, or 280 days—*i.e.*, ten menstrual periods.

To determine the probable date of birth (I quote from Jellett) :

'Naegele counted from the first day of the last menstruation. He subtracted three months from that, and then added seven days, or in leap-year six days, if February were included in the time. For instance, if the patient began to menstruate on July 1, count back three months, to April 1 ; then add seven days, to April 8 ; count forward a year, and the result will be the date of delivery'—*i.e.*, if the woman last began to menstruate on July 1, 1908, she will probably be delivered on April 8, 1909. It is better not to foretell that the child will be born upon a certain day, as it is very difficult to obtain accurate statements from patients, but rather to say that it will be born *about* the date obtained by the above calculation, *if* the given dates are correct.

Signs and Symptoms.

The uterus remains within the pelvis until the end of the fourth month, so earlier than this there is no

abdominal swelling. Three other signs, however, usually show themselves within the first three months. These are :

1. Stoppage of the monthly flow. This usually ceases as soon as conception has occurred. (Rarely menstruation goes on for three months.)

2. Morning sickness.

3. Changes in the breasts. There is usually pain or tenderness in the outer part of the breast ; the gland feels harder and more knotty than usual ; it enlarges, and the veins coursing over the skin of the part become more prominent ; the nipple erects itself, and the skin immediately surrounding it becomes brownish in colour. This is especially to be noticed in dark women, and is, of course, more valuable as a sign of early pregnancy in women who have never borne a child, as, once being established, the brown colour remains. In many cases a few drops of colostrum can be squeezed from the breast, and in some instances this comes away spontaneously. Later on a more extensive pigmentation of the skin occurs, the whole area taking on a brownish colour, with fleckings of white. After the fourth month the term of pregnancy reached can be determined by observing the height of the fundus in the abdomen. At the end of the fourth month it is level with the pubes ; at the end of the sixth it is at the navel ; at the fifth it is midway between the two ; also, at the end of the eighth it is nearly up to the lower end of the breast-bone, and at the seventh midway between navel and breast-bone ; at the ninth it has sunk somewhat in

vertex cases, as the head has begun to settle into the pelvis.

Other signs of pregnancy are :

The softening of the neck of the uterus as it protrudes into the vagina.

The blueness of the parts about the vulva and of the vaginal mucous membrane.

The stretching of the skin of the abdomen, with giving way of its deeper parts, which results in the formation of a number of pinkish or whitish lines in the depths of the skin (striæ gravidarum), the alternate contraction and relaxation of the uterus, which can be felt at intervals through the abdominal wall. These contractions are very slow during pregnancy, and may be recognized by the fact that when the uterus is contracted its shape and size can be made out, whereas during relaxation the shape and size of the child are revealed.

The movements of the fœtus, which can be both seen and felt. If the parts of the fœtus are distinctly felt by a skilled examiner, it is a *certain* sign that the woman is pregnant.

The hearing of the fœtal heart is another certain sign.

Most of the other signs can be produced by other causes, but the presence of several of them together is strong evidence of pregnancy.

There are other signs, but those mentioned above are quite sufficient for the midwife's purpose.

Physiologically the pregnant woman is in a state of high tension, and is apt to be more easily upset than under ordinary circumstances. She often has strange

fancies as regards food, etc. ; she may be very irritable, or, on the contrary, more placid than is her wont. She should be exhorted to make a strong effort after self-control, and to bear the inconveniences of the condition with as much philosophy as may be, knowing that in a short time they will be at an end. Many of the poorer women are marvels of patient cheerfulness during their pregnancy, really acting the part of heroines, though hardly ever receiving any praise.

The woman should be reminded that her temperament, cheerfulness, self-control, etc., or the reverse, will impress themselves upon the developing child for good or evil, and that it is within her power to do much for it by giving it a good start in life from the very outset.

One hopes that it is needless to remind present-day midwives of the fact that a fœtus, from the moment of its conception, is a living being, and that to destroy it, *however early,* is to commit manslaughter. In this connection midwives have greater opportunities than most people for doing good by stopping the pernicious practices so common amongst pregnant women, by means of which not only is their own health often undermined, but the country's birth-rate is kept low, and the intra-uterine life of numbers of infants rendered so unhealthy that, if born alive at all, they are launched upon life as hopeless cripples or invalids.

Hygiene and Management.

The mother has during her pregnancy to build up the structure of another being—to breathe, feed, and

excrete for it—and also to prepare herself for the very severe muscular work and general strain involved in giving birth to the child. She must, therefore, have plenty of fresh air, and her digestive and excretory systems must be kept in good working order, also her muscular power must be cultivated by sufficient exercise. She should, in short, live a healthy, natural life, and should be regular in all her habits, avoiding as far as possible any suspicion of invalidism.

Exercise.—The ordinary household duties and walking in the fresh air are the most suitable forms of exercise. Cycling and driving in jolting vehicles, such as motor-omnibuses, should be avoided, also the lifting of heavy weights, prolonged standing, stretching the arms upwards, as in curtain-hanging; and even the exercises recommended, if they produce fatigue, should be stopped until the fatigue has gone off. Especially should the woman be careful to avoid strain at the times which would have been the monthly periods; it is at these times that abortion is likely to occur, especially in those who have aborted once or more, and these patients would be well advised to take time by the forelock, and stay in bed for three or four days every month until the completion of the fourth month, after which time the placenta is fully formed, and the ovum anchored by it to the interior of the uterus, and less likely to become detached. At the sixth, seventh, and eighth monthly periods, also, care should again be taken. If there is any bleeding at these times, not only should the woman lie in bed, but *absolute* quiet and rest should be secured for her, if necessary, by

some sedative draught prescribed by a doctor. Abortion involves much more risk to the mother's health than full-term labour, and it is often because they have failed to realize this that young women, almost from the time of their marriage, enter upon a career of invalidism, which quite unfits them for their duties as wives and mothers. It is of the utmost importance to the family happiness that the mother should be strong, fit, and cheerful, and the poor woman who is being constantly pulled down by miscarriages cannot be so. Here also the midwife, as family guide, philosopher, and friend, can do much to avert such misfortune.

Rest.—The pregnant woman should avoid late hours and have long nights—eight hours at least, and nine when possible, especially towards the end of the time. She should also in the later months rest a little during the day when fatigued, with her feet at a higher level than her shoulders; this diminishes the tendency to varicose veins of the legs, and, by taking the weight off any that may be present, lessens the risk of rupture.

Food.—A generous mixed diet is best, unless there is any reason for special dieting, in which case a doctor should always be consulted, and the dietary laid down by him or her strictly adhered to. The growing fœtus, as well as the mother, needs for healthy development the three principles of food—fats, carbohydrates, and proteids—and these are most economically combined in an ordinary mixed diet. The prospective mother requires a little more food than the non-pregnant woman, but when one considers the amount taken by the newly born child, one sees that this

necessary excess of food is very slight. Poor women, however, who are habitually half-starved, should, if it be possible, have a considerable addition to their ordinary diet during pregnancy, if they are to get through the trial without undue draining away of their own strength.

Porridge is a very valuable food here, for not only does oatmeal contain more fat and earthy salts than other kinds of cereals, but the indigestible parts of the coarse meal tend to prevent constipation. The diet should include plenty of water, also *fresh* fruit and vegetables. All indigestible articles and all things of doubtful soundness should be excluded, such as pork, sausages, fish, fruit, or vegetables which have been kept some days, etc. If possible, the tendency to constipation so common in pregnant women should be overcome by articles of diet which are laxative—such as brown bread, honey, figs, olive oil (which can be pleasantly taken with sardines or salad), currants, and other fruits, etc. If, however, these do not produce a daily action of the bowels, some aperient should be given; and it must be borne in mind that castor oil, which, in sufficient doses, is excellent for removing fæcal masses, is of no use for bringing about the cure of habitual constipation. On the contrary, it is worse than useless, except for the purpose of producing a good evacuation, as its later action and its action when given in small doses is to constipate. Syrup of figs, syrup of senna, compound liquorice powder, and, for those who can afford it, Tamar Indien, are excellent gentle aperients.

Above all things, the expectant mother must avoid

alcohol in all its forms. Statistics prove that women who take alcohol are less well themselves, and also are less able to suckle their babies. Much of the present high rate of infant mortality is due to prospective and nursing mothers taking alcoholic stimulants.

Dress.—This should be light in weight and warm. Wool next the skin is better than cotton, as the wearer is less likely to suffer from chill. The weight should hang, as far as possible, from the shoulders, and all pressure upon breasts, abdomen, and waist should be avoided. Garters should be prohibited, as they increase the tendency to varicose veins.

Fresh Air.—The woman should sleep with her window open. She should be out every day, unless the weather is very inclement. Her house should be airy, the windows being wide open during the day, and plenty of sunshine admitted. It is well to have the lying-in room thoroughly cleaned, including walls, floor, and ceiling, some time before labour. The bed and windows are better without curtains and hangings; but if these must remain, they should at least be cleaned before the confinement. The room should be removed from all source of foul smell—sink, water-closet, dust-bin, etc. Stables and other sources of foul odour in the immediate vicinity are harmful, as the habitual breathing of impure air depresses the woman's vitality and impairs her strength. It is quite worth the patient's while, therefore, to remove from the neighbourhood of such before her pregnancy is far advanced.

Baths, etc.—The skin should be kept in a condition of activity by the frequent use of soap, plenty of hot

water, and brisk rubbing. With regard to baths, the cleanly woman should follow her usual habit during pregnancy, taking special care, however, at the times which would have been her monthly periods. The uncleanly woman should be taught habits of cleanliness. The skin is one of the avenues of excretion, and has extra work to do during pregnancy. Especially should the region of the external genitals be kept clean. Attention to this will prevent much of the irritation which is so troublesome at this time.

Preparation of the Nipples.—This is most important. Pressure upon them should be removed by, if necessary, cutting out half-moon-shaped pieces from the breast of the stays. If the nipples are depressed, they should be drawn out by the breast-pump. (A ginger-beer bottle makes a capital breast-pump for this purpose. The bottle is to be filled with hot water, emptied, and applied to the middle of the breast. As the air inside the bottle cools it contracts, and the nipple rushes into the bottle.) This drawing out has to be repeated again and again, and the nipple gradually made to take up a good shape by manipulation with the fingers. Each attempt seems to do very little, but patient and persevering efforts will in time transform very unpromising nipples into quite useful ones. And it is *always* worth while to spend time upon this work, as it makes all the difference to the after-life of the child for it to have a good start and to be naturally fed.

If the skin of the nipples is hard, dry, and inclined to become cracked, it should be washed with warm

water, and then treated with boracic ointment daily until it gets into good condition. On the other hand, if it is already too soft and moist, it should be hardened, after washing, by treatment with spirit lotion (equal quantities of spirit and water or eau-de-Cologne answer well for this) or glycerine of tannin.

Some of the Minor Ailments of Pregnancy.

Morning Sickness.—This is usually slight, and passes off as soon as the uterus has risen out of the pelvis; but it is sometimes more severe, and in an extreme case may even cause exhaustion and death. A cup of tea given to the woman before rising in the morning, or breakfast in bed, will usually render the trouble bearable. If it is more severe, especially if it becomes increasingly troublesome at what would have been a monthly period, the woman should stay in bed for three or four days; this will in many cases avoid a miscarriage. Sometimes derangement of stomach or bowels aggravates matters, and when this is attended to and errors of diet corrected, the trouble subsides. Small doses of Epsom salts (10 grains) in a little peppermint-water, taken before meals, will often be found very beneficial. If there is constipation, this must be relieved by a suitable aperient. Small doses of the effervescing salines—*e.g.*, citrate of magnesia—also act well; but if the trouble does not yield to such simple remedies, a doctor should be consulted.

Neuralgia.—This very often depends upon an unclean condition of the teeth and gums, which causes

irritation and pain in the nerves of the face and head. It can often be relieved by getting the mouth into a healthy state. Cyllin and warm water (30 drops to a tumblerful) make a very good mouth-wash, and will often ease toothache. If a hollow tooth is the irritating agent, a dentist should be consulted.

Sometimes stomach derangement or general debility conspires with the unclean mouth to produce the mischief, and in these cases digestion must receive attention or a tonic be given.

Often the condition is due to having sat in a draught, and for this heat, in the shape of hot fomentations or a bag of hot salt or hot bran applied over the painful part, is good treatment. Here also constipation is often a contributory cause of pain, poisonous matters having been absorbed into the general economy from the accumulation in the intestines, and relief of this produces general improvement.

Heartburn is usually associated with indigestion and acidity of the stomach contents. Attention to diet and bowels will usually remove the cause of the trouble, and a little sodium bicarbonate (5 grains) in peppermint-water relieve the discomfort.

Anæmia.—This should be treated by more fresh air, better food, and tonics. Often in these cases constipation, indigestion, and bad teeth are at the root of the matter, causing as they do a combination of poisoning and semi-starvation, and these must be treated before any benefit can be looked for from tonics.

Varicose Veins.—These, when present, become increasingly painful and troublesome as pregnancy

advances. The aggravation is due to the additional weight required to be supported, and is best relieved by taking the weight off—viz., by resting with the legs upon a somewhat higher level than the body. Careful bandaging of the legs from the toes upwards also affords support and relief. The bandage should be put on before the patient rises in the morning, and should not be removed until after she is lying down to rest at night; also it must be evenly put on, so that every part of the leg receives equal support, and due allowance must be made for bending at the knee.

Indiarubber bandages are excellent, but the ordinary calico bandage will answer. If indiarubber is used, the bandage should be cleansed when it is taken off, and hung up during the night in order that it may retain its shape. An abdominal bandage is also useful, as, by supporting the weight of the child, it takes a certain amount of pressure off the veins of the lower limbs.

Varicose veins of the vulva are apt to cause much irritation, and for this cleanliness and the application of some soothing ointment (such as hazeline ointment) are the best remedies. A doctor should be consulted in case of varicose veins of the vulva, as they are apt to give trouble, sometimes bursting during the strain of labour, and causing dangerous hæmorrhage.

The annoyance of *varicose veins of the rectum* (*piles*) has usually to be borne until after the birth of the child—*i.e.*, until the pressure upon the internal veins has been removed—after which, unless of old standing,

they usually get better. Much may, however, be done to lessen the pain.

Constipation greatly aggravates the condition, and its relief considerably improves matters. When the piles prolapse, they must be returned to their proper place — viz., the rectum; otherwise they become squeezed, congested, and inflamed.

In replacing hæmorrhoids the nurse must bear in mind the fact that at the lower end of the bowel there is a ring of contractile muscle some 2 inches in depth, whose duty it is to keep the passage closed. The piles must be pushed well up above this ring; otherwise they become nipped by it, and the nipping causes great pain. The parts should be kept very clean, and some soothing ointment applied; here, again, Hazeline ointment is very useful. If the parts are very painful, the patient will experience great relief from steaming them. The steam of hot water containing 1 teaspoonful of Friar's Balsam to the pint is particularly soothing, and after this the patient will be able to bear the piles being returned.

If the piles are of old standing, the midwife should advise the patient, as soon as she has recovered from her confinement, to consult a surgeon, and ascertain whether or not they can be cured by surgery. Piles tend to get worse as middle age comes on, and sometimes more serious trouble lies behind them; the midwife will therefore be doing her patient a service by leading her to seek advice in the matter.

Vaginal Discharge and Irritation of the Vulva.— Absolute cleanliness and the use of antiseptic lotions

are the treatment for these conditions, and should be followed by a soothing ointment in cases of irritation.

Conditions in which a Doctor is required.

1. When the patient is a *dwarf or deformed.* In these cases the pelvis is usually misshapen, and it may be impossible for a living child to be born. Here medical advice should be secured early in pregnancy, in order that there may be time to decide upon the best course of action. Cases of spinal curvature (hump-back), hip-joint disease, knock-knee, flat-foot, bending of the bones due to rickets, or shortness of one leg due to any cause, would come under this heading; also those in which, without other obvious deformity, the diagonal conjugate diameter is found on measurement to be too short.

Pendulous abdomen (*i.e.*, an overhanging condition of the front wall of the body) is in a *primipara* very suggestive of flattened pelvis; and if, on examining the pelvic pole, the presenting part cannot be pushed into the brim, the suggestion becomes a certainty, and a doctor should be consulted. In a woman who has borne many children pendulous abdomen may be due to laxity of the body walls, and is best remedied by letting the woman lie upon her back, replacing the overhanging portion, making sure from abdominal examination that the child is in good position, and putting on a tight binder to keep it so. If the woman is very small, with narrow hips, it suggests that the pelvis is too small in all its dimensions; and if in addition the interspinous and intercristal diameters are less than 10 and $10\frac{3}{4}$ to 11 inches respectively, the

suspicion is confirmed, and in all probability it will be impossible for such a woman to give birth to a full-term child of normal size. The midwife should always endeavour to estimate the size and consistency of the head of the child, and its relation to the size of the pelvis of that individual woman, because, in those cases in which the head is small, although the pelvis is smaller than normal, the child can be born. On the other hand, if the head is unusually large and hard, although the pelvis is of normal size, there may be great difficulty, especially if the woman's strength or self-control is deficient. In order to do this the head must be got well between the hands during the abdominal examination, in such a way that an idea can be formed as to the length of its diameters. In the case of the hydrocephalic head ('water on the brain') not only will the diameters be too long, but there will also be a sensation as of a fluid swelling communicated to the examining hands.

2. When there is *loss of blood.* In early pregnancy this may mean threatened abortion or extra-uterine pregnancy, or some abnormal growth in the uterus; later it may mean unduly early detachment of the placenta. These are all serious conditions, and will be entered upon more fully in the chapter upon hæmorrhage; here let it be simply remarked that such cases require medical aid.

3. When there is *any abnormality or complication,* such as—

Excessive sickness;
Puffiness of hands or face; or
Dangerous varicose veins.

The first and third of these have been discussed above; let us now turn our attention to the second, and see what such a condition may mean. It probably means that the patient is suffering from albuminuria or kidney disease, or that she is going to have fits—eclampsia. The most important thing in such cases is that the treatment should be begun early, as by this means it is often possible to prevent fits; therefore no time should be lost, if there are any grounds for suspicion, in securing medical advice, and while the midwife awaits the arrival of the doctor she may safely give the patient an aperient and put her upon milk diet. Meat, eggs, and fish act as so much poison in these cases, and must be strictly forbidden. Measures for securing free perspiration, such as hot drinks (not alcoholic)—barley-water, lemon-juice, and hot water, etc.—and packing in bed with hot bottles, are also useful, and can be safely undertaken if there is delay in getting a doctor. When the latter arrives suitable treatment for the case in question will be ordered, and the nurse must stay and help to carry it out.

Every midwife should know how to test urine for albumin, as this is present in very many cases before the onset of fits.

Test.—Take a *clean* test-tube or spoon, pour into it some urine, add a few drops of vinegar or one drop of dilute acetic acid. Boil the acidified urine.

If albumin is present a whitish cloud will be seen in the test-tube at the part which has been boiled. A slight cloud which might otherwise be overlooked can be seen by holding the tube against a dark background.

Eclampsia.

This is a disease which usually occurs in untreated cases of albuminuria in pregnant women.

Occurrence.—The condition is much more frequent in first pregnancies than in later ones. In a long series of cases 76 per cent. of the sufferers were primiparæ.

In twin pregnancies eclampsia occurred six times as frequently as in others, and in from 7 to 8 per cent. of twin cases it was present.

The symptoms do not usually come on until the later months of pregnancy, and in a few cases the fits only occur after delivery.

Premonitory symptoms are—

Headache ;
Muscular twitchings ;
Restlessness ;

Some interference with vision—*e.g.*, partial or complete loss of sight, or the sensation of flashes of light, or of black spots before the eyes ;
Pain at the pit of the stomach, vomiting, constipation ;
Scantiness of urine, with sometimes puffiness of face and ankles, and sometimes a more general œdema.

In the series of cases mentioned above, in 49 per cent. there was no œdema ; in 35 per cent. there was slight œdema of face and ankles ; in 16 per cent. there was extensive general œdema.

It will thus be seen that this symptom is variable, and should not be waited for. There is usually pallor of face and a rising temperature and pulse-rate.

In many instances only a few of these symptoms are present early; and if the midwife observes only one or two of them, she should without delay examine the urine, and continue to do so every few days if at first she fails to find albumin.

The urine of all pregnant women should be examined for albumin once a month

The fit itself usually begins with twitchings of the eyelids and spasm of the respiratory muscles; then comes the stage of tonic spasm, in which the patient is rigid; then the clonic stage, in which there is convulsive movement; and, lastly, insensibility or coma.

The fits may be few in number, with long intervals between, or they may follow each other in quick succession. The mother's life is in imminent peril, and every fit adds to the danger.

Death may occur from—

(1) Heart failure;

(2) Suffocation from excess of fluid in the chest cavity (or œdema of the lungs); or

(3) Hæmorrhage into the brain.

Sometimes the fits come on only after delivery. These are very serious cases, and a doctor should always be fetched without delay at the first sign of convulsions.

Epilepsy and hysteria sometimes show themselves during pregnancy. To distinguish between these

varieties of fits, the following points should be remembered:

In *eclampsia* the fits occur for the first time during pregnancy or soon after delivery. The urine is scanty and contains albumin, and the temperature may be raised.

In *epilepsy* the fits often begin in childhood. The urine is abundant, often passed unconsciously; it does not invariably contain albumin, and the temperature is often below normal. In both cases the patient is unconscious, while in *hysteria* she is conscious. Any kind of fit would come under the heading of abnormal conditions, which require medical aid.

Retention of Urine.

Occurring early in pregnancy, this is likely to be due to a backward displacement of the uterine fundus, which has caused the cervix to press upon the urethra, and, by obliterating the passage, it prevents the outflow of urine. The condition is one involving great danger to the mother, as, if left untreated, it gets worse and worse. The retained urine undergoes decomposition, and sets up inflammation of the bladder (cystitis). In cases of retention during the first three months of pregnancy a vaginal examination should be made, and if the neck of the uterus is found pointing forwards, a doctor should be called in, in order that the uterus may be put into good position.

Displacement of this kind is not likely to occur later in pregnancy, as the uterus is then too large to slip backward into the pelvis.

The sign of retention is a large, tender, elastic swelling, centrally situated in the lower part of the abdomen ; there will also be a history that the patient has been unable to pass her urine properly for some time. Occasionally a little urine will be found dribbling away ; this, coupled with a distended bladder, is termed retention with incontinence of urine. The dribbling is due to the fact that the bladder is being overfilled.

Anatomy of the Ovum and Functions of its Parts.

After fertilization has taken place, the outer coat of the ovum (or human egg) takes on a shaggy appearance, from the growth upon it of numerous tiny projections, called primitive villi, which serve the purpose of rootlets, and attach the embryo (or developing infant) to the uterine wall, and, later, act as paths and scaffolding for the elaborate system of bloodvessels which will afterwards form the placenta. The ovum being thus firmly anchored in its position, the rest of the villi usually disappear, leaving the surface of the ovum more or less smooth.

This outer coating or shell of the ovum is called the *chorion*. Within it lies another enveloping membrane, the *amnion*.

Inside this double membrane is the water, or *liquor amnii*; and in the latter fluid the fœtus floats freely during the early stages of development, and learns to exercise its tiny limbs and muscles, being suspended simply by its cord. If the human ovum be compared

FIG. 14.—HUMAN OVUM OF EIGHTH WEEK. (Carpenter.)

The growth of villi preponderates at one part; at other parts the villi already becoming atrophied.

FIG. 15.—ATTITUDE OF THE MATURE FŒTUS 'IN UTERO.' (Galabin's 'Midwifery.')

[redacted]n's egg, the position of the chorion is like that [redacted]e outer shell, the amnion lies in the position of [redacted] thin white membrane which lines the shell, and [redacted]ne liquor amnii corresponds to the white of the egg.

The placenta is formed partly from the tissues of the [redacted]tus and partly from those of the mother.

[redacted]he *fœtal portion* is an elaboration of the primitive [redacted]developed upon the outer surface of the *chorion*, [redacted]he site of attachment of ovum to uterus.

[redacted]Each primitive villus divides again and again, until it [redacted]becomes a complex mass of branches, something like a piece of fine seaweed. At the same time, blood-vessels, springing from the fœtus, come along the developing umbilical cord, and make their way into the villi, each villus receiving a vessel, and each vessel branching in such a way that every tiny offset has its own bloodvessel, and receives blood from the fœtus. Vessels for the return of blood are also formed, and run in company with those bringing blood in the opposite direction, the result being that a constant circulation of blood is kept up—from the fœtus to the placenta, back again to the fœtus, where it circulates in all parts of its body, and then back again to the placenta, and so on and on.

The *maternal portion* of the placenta is developed from the lining membra[redacted]f the uterus in the same situation (known as the decidua basalis). Here the maternal bloodvessels increase in size until they form large spaces, into which the fœtal villi dip themselves, and the wall of separation between the blood in the

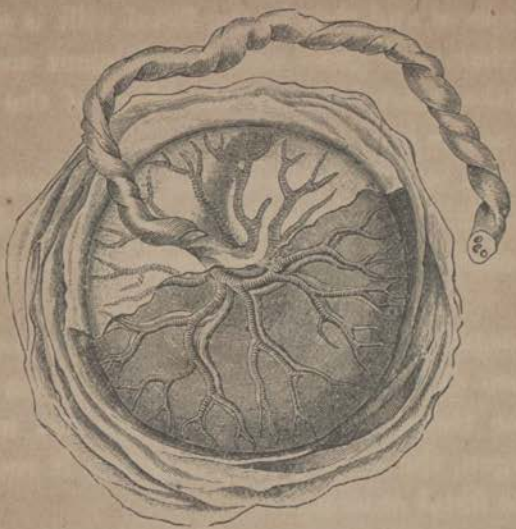

FIG. 16.—FŒTAL SURFACE OF PLACENTA. (Galabin's 'Midwifery.')
Amnion stripped from one-half and removed.

FIG. 17.—UTERINE SURFACE OF PLACENTA. (Galabin's 'Midwifery.')

maternal spaces and that in the fœtal villi is so slight that interchange of gases and of nutriment and waste material takes place between the blood of the mother and child across it.

This brings us to the functions of the placenta, which are threefold: it performs for the fœtus the duties of lungs, stomach, and excretory organs. In other words, it is—

1. An organ of *respiration*. The fœtal blood, laden with carbon dioxide, goes to the placenta, leaves this useless gas there, and takes up from the maternal blood oxygen, the vital gas, with which it returns to refresh the fœtal economy.

2. An organ of *nutrition*. The fœtal blood, while in the placenta, takes up food materials from that of the mother, and, returning, carries them to the fœtus.

3. An organ of *excretion*. The waste matters of the fœtus are carried to the placenta, deposited in the mother's blood, and got rid of by her excretory organs.

Occasionally the placenta takes up an undesirable function, and acts as a carrier of infection between mother and child.

The use of the membranes, besides furnishing the placenta, is to enclose the fœtus and liquor amnii, and at the time of labour to combine with the latter in forming a powerful wedge, by means of which the cervix of the uterus can be made to dilate.

The use of the cord is to suspend the fœtus in the liquor amnii, and to carry the large bloodvessels running between fœtus and placenta.

FIG. 18.—FŒTUS 'IN UTERO' AT FIFTH MONTH. (Galabin's 'Midwifery.')

FIG. 19.—BRIM OF THE PELVIS AND BASE OF THE FŒTAL SKULL IN THE FIRST CRANIAL POSITION. (Galabin's 'Midwifery.')

The liquor amnii also has three functions :

1. Enclosed in the membranes it forms a water cushion around the fœtus, and protects it from shocks and injury.

2. It affords a fluid medium in which the fœtus can exercise itself as development proceeds.

3. With the membranes it forms the powerful fluid wedge mentioned above, which is such a valuable dilator of the passages.

CHAPTER VII

LABOUR

THIS is the process by means of which the child and its membranes are expelled from the mother.

All through pregnancy the uterus has been getting into training for the supreme effort which will presently be demanded from it in giving birth to the child, by alternately contracting and relaxing. These contractions are painless until the time of birth approaches, when they become painful and more and more vigorous, causing erection of the uterus and opening up of its narrow neck in order that the child may be thrust through. These painful contractions are called labour pains, and when they are present labour is said to have begun.

First a wave of contraction passes upwards from the neck to the fundus, tending to pull open the neck of the womb; then the upper part of the uterine muscle contracts, pushing the ovum downwards, and the bag of membranes is driven into the opening so made, much in the same way that a wedge is driven into a block, with the result that still further opening is effected. This occurs again and again as the pains repeat themselves, each pain causing more and more

dilatation, until the canal of the neck becomes continuous with the cavity of the body of the uterus, and no neck can be felt upon vaginal examination.

The length of time occupied in this opening up of the parts is called the *duration of the first stage of labour;* it must be noted by the clock, and entered in the register as so many hours and minutes. The time varies widely in different people, being sometimes twenty-four or more hours in a primipara, and perhaps less than one hour in a multipara.

Usually as soon as dilatation is complete the bag of membranes gives way and the waters escape. It is always desirable that this should not happen too soon, as when it does the valuable dilating wedge is lost and labour is apt to be tedious. Next the child is pushed through the vagina, and the time occupied in its expulsion is called the *duration of the second stage;* this must also be noted in the register. After the birth of the child comes a short interval of rest for the uterus, and then the after-birth and membranes are thrust out; the time required for this is called the *duration of the third stage*, and must be noted.

Briefly to recapitulate, labour is divided into three periods or stages:

1. *The dilating stage*, which lasts from the first true labour pain until the neck of the uterus is fully open.

2. *The expulsive stage*—from full dilatation of the neck until the birth of the child.

3. *The placental stage*—from the birth of the child to the delivery of the after-birth and membranes.

Character of the Pains.

True labour pains are like the waves of the sea—each begins gently, attains a maximum, and gradually goes off; they usually begin in the back (people who have actually suffered them say that this is by no means always the case), pass around to the front, and down the legs to the knees. Each pain advances labour, and they recur with some degree of regularity.

False pains are often present before the onset of true labour. These are usually colicky in origin, have characters the opposite of those mentioned above, and are remedied by an aperient.

The pains of the first stage are said to be sharper and harder to bear than those of the second; also, labour does not seem to the sufferer to be making much progress: she is often therefore more difficult to manage. Later, when the second stage has begun, she finds that she can aid in expelling the child by her own efforts; she therefore turns her attention to this, and becomes more amenable. The behaviour of the woman often gives one a clue as to the stage of labour reached as soon as one comes into her presence.

Mechanism of Normal Labour.

Forces acting upon the Passenger.—1. *The uterine force*—at first *indirect*, as during the first stage of labour, when it acts upon the baby through the unruptured bag of membranes and liquor amnii (as long as the child is surrounded by this protective

water-cushion it is not likely to be subjected to any harmful pressure; hence delay in the first stage is rarely attended by danger to the child); after rupture of the membranes *direct*, when the uterus presses upon the child itself. Here delay is more dangerous, as the pressure may cause injury to the child.

The uterine force acts at greatest advantage when the woman is in the upright position or lying upon her back, and less powerfully when she lies upon her side; hence it is customary to let her stand during the pains of the first stage, leaning, perhaps, against a chair, and lie upon her back during the second, when it is desired to quicken the pains, whereas when the pains are already too violent she is allowed to lie upon her side.

2. *The auxiliary forces*—viz., the contraction of the voluntary muscles of the woman's chest and abdomen. These only aid matters during the second stage—*i.e.*, after dilatation is complete. The woman, therefore, should not be allowed—and even exhorted, as she sometimes is—during the first stage to waste her strength by holding her breath and 'bearing down.'

3. *The resistance of the soft parts.* This keeps matters back, and often renders labour tedious. It is greater in primiparæ, whose parts have never been fully expanded, than in multiparæ, and in cases of old laceration of the neck of the uterus or of new growth there it may altogether prevent advance of the head, and require surgical interference.

Movements of the Fœtus.—In the ordinary vertex

presentation the child's head enters the pelvis flexed, with its occiput in front, slightly to the left of the middle line, its forehead towards the mother's right sacro-iliac joint, the sagittal suture in the right oblique diameter at the pelvic inlet, and the right parietal bone leading. Under the action of the expulsive forces the head is driven lower into the pelvis, *descending*, *rotating* forward through one-eighth of a circle, and at the same time becoming *increasingly flexed*, owing to pressure against the forehead. The occiput now becomes fixed beneath the pubic arch, and the forehead, being driven in the direction of least resistance, sweeps over the perinæum, and is born by *extension*.

During its passage through the pelvis the head has become somewhat twisted with regard to the shoulders. As soon as it has freed itself from the vulva, therefore, it rights itself, giving a slight rotatory jerk in one or other direction. This movement is called *restitution*. Afterwards the head turns through a right angle, in order to bring the shoulders into the long axis of the pelvic outlet, and usually looks towards the mother's right thigh ; this movement is called *external rotation*.

Briefly the movements are :

Flexion.
Descent.
Internal rotation and
Increasing flexion. } Occurring simultaneously.
Extension.
Restitution.
External rotation.

Management.

The midwife should go to the case as soon as she is called, and as quickly as possible find out the exact state of affairs.

1. She requires to find out whether the woman is pregnant.

2. Whether she is in labour.

3. Whether, if so, her general condition is satisfactory and her pelvis of normal size and shape.

4. Whether the position of the child and the presentation are normal.

5. What stage of labour has been reached, and the probability or otherwise of a safe and speedy termination.

A few questions as to previous confinements will help to throw light upon these probabilities in a multipara, but a primipara should have been examined before the onset of labour. The character and frequency of the pains, and the amount of advance produced by each, will be a guide as to progress, and the condition of the cervix and os, whether soft and dilatable or hard and rigid, will give a clue as to the amount of resistance to be overcome.

Having carried out the examination described in the special chapter devoted to the subject, the midwife will be able to decide whether or not she can safely leave the case. If the woman is not in labour, or if only early in the first stage, it may be advisable to go away for a time; but an address must be left (or several, if the midwife is going her rounds, in the order in which she intends taking them), that she may be quickly

summoned in case of emergency. If the second stage has begun the midwife must not leave (see C.M.B. rules E, 6).

During the first stage all things likely to be required should be put ready, the bed prepared, and the baby clothes, in the order in which they will be needed, laid out near the fire. The patient herself can assist in this, and it will interest her and keep her mind off her suffering if she is employed in the intervals of pain. If a bath is available, it is very comforting to her to take a warm bath : the heat eases the pain and helps dilatation. She may stay in the bath some time, provided that care is taken to keep up the heat of the water, to protect the shoulders of the patient, and to wrap her up well when she is about to return to her room ; otherwise she would suffer from chill, and more harm than good result. After the bath the clean clothes should be put on, and pinned well up around the chest, in order that, when labour is over, they may be simply pulled down, and the patient spared the disturbance of having her clothes changed.

If the patient is constipated, she should be given an aperient (preferably 1 ounce of castor oil, shaken up with warm milk) early in the first stage, to be followed in about two hours by a soap-and-water enema. In any case it is well to wash out the lower bowel by an enema shortly before the head is expected. If the fæces are hard and impacted a glycerine enema will stimulate the rectal muscle and cause relief.

The bladder should be emptied at short intervals—naturally, if possible ; but if there is much distension,

and the pressure of the head is preventing the natural emptying, the head should be pushed up a little, and a catheter passed.

The patient's strength must be kept up by frequent small supplies of nourishment and hot fluid (not alcohol). Beef-tea or Lemco is very comforting, and at the same time stimulates uterine contraction; tea, sweetened plentifully with sugar, also acts well. If she feels inclined to eat, by all means let her have a good meal early in labour; it helps her with the heavy piece of work before her, and also tends to prevent the ravenous craving so often seen in the infants of women who have fasted for hours before the birth of the child, and which leads compassionate friends to give the poor baby delicacies for which its stomach is not ready.

Every care should be taken to prevent too early rupture of the membranes, but, if they have given way before dilatation is complete, the patient should be put to bed, and, other things being normal, told to lie upon her back.

After rupture of the membranes the midwife should again cleanse and disinfect her hands and the patient's genitals, and make a vaginal examination, in order to find out whether or not the rush of escaping liquor amnii has brought down a loop of the cord, or in any way altered the presentation.

Plenty of clean water, both hot and cold, should be in readiness, being kept covered to prevent absorption by it of the foul air of the room; the douche apparatus, with newly boiled nozzle, should be put together, in case it is required, and lotion and clean pieces of linen

prepared for the baby's eyes, and a suitable dressing and powder for its navel. A bowl of lotion should be kept near the bed, into which the midwife can put her hand frequently while delivery is proceeding, and also a supply of clean swabs, which will be required from time to time.

In normal cases it is not necessary or desirable to give ante-partum douches, as the passages are naturally clean and aseptic; if, however, there is an unclean vaginal discharge, this must be cleared away shortly before the birth of the head, in order to prevent infection of the eyes of the infant. A warm cyllin douché (1 teaspoonful to the quart of water) should be given, and all adherent discharge removed with clean lint wrapped around the midwife's fingers. The midwife should stay near the patient, supporting her back during the pains, rubbing her legs if they become cramped, and encouraging her generally; but all unnecessary interference should be avoided. The patient should, as soon as the os uteri is fully dilated, be given a towel, attached to the foot-rail of the bed, to pull upon, and be exhorted to hold her breath and bear down during the pains. It is usual in England to let the woman lie upon her left side, with her knees well drawn up and a pillow or two placed between them, and her hips brought to the edge of the bed; and, while it is most necessary that the scene of events should be laid bare, and that the midwife should watch the progress of labour and cleanse the parts from time to time, all exposure of other portions of the body must be avoided, both for the prevention of chill and

also in order that the woman's sense of decency may not be outraged.

As soon as the head distends the perinæum, the woman's roller towel should be taken away, and she should be told to cease bearing down. When the occiput has got below the pubic arch the midwife should relieve tension upon the perinæum by pushing the head forwards and squeezing it out in the interval between two pains: this aids its extension and enables it to escape without tearing the perinæum. Some judgment is required as to the right moment at which to do this: if done too soon, it is worse than useless, as it simply retards the birth; but if done at the right moment, it will in nearly every normal case save the perinæum.

To understand when to do it, follow carefully the mechanism of expulsion described above, and remember that the object is to aid *extension* of the neck *after the occiput has escaped beneath the pubic arch*, also that the head must not be allowed to come through at the acme of a pain.

The head being born, the eyes must be rapidly cleansed, before they open, from the mucus, etc., which hangs about the lids, and the cord must be felt for around the neck, and if present, slipped over the head. In the very rare case when the cord cannot be slipped over head or shoulders, it must be divided and clipped or held.

The head is now gently guided towards the mother's right thigh, and the shoulders come down. If there is difficulty or delay, the more accessible arm may be

brought down by hooking a finger through the space between arm and chest, and drawing down in the plane of the shoulder-joint. Avoid pressure in the armpit, which would injure important nerves lying there and cause paralysis of the arm; also pressure against the bone of the upper arm, which is fragile and easily broken. During the birth of the body the midwife's hand should be placed upon the mother's abdomen in such a way that the little-finger border of the hand sinks deeply into the hollow behind the contracting uterus, and the fundus lies in the palm. In this way the midwife can control the fundus and feel any contraction or dilatation which may occur. If possible, the hand should remain there until after delivery of the after-birth, as control of the uterus, once lost, is difficult to regain, and it is of the utmost importance that the midwife should know what is happening. The other hand should support the baby and guide it to a place of safety, and as soon as it is born, the mother should be told to turn over and lie upon her back. In this position there is less danger of air making its way into the genital passage, and also the uterus can be more easily controlled, and, when necessary, the placenta expressed. The fundus should, after the birth of the baby, be allowed to lie passively in the hand for a little while, and unless bleeding is occurring or the uterus is felt to be dilating, no attempt should be made to excite contraction. The uterus will thus soon recover from the fatigue of expelling the child, and will begin to contract spontaneously. After a few contractions it will suddenly become smaller and rise

higher in the abdomen; the cord also, hanging from the vagina, will descend. When this occurs the after-birth is expelled from the uterus and lies in the vagina, from which it can easily be expressed by downward and backward pressure upon the fundus. As the perinæum is once more distended by the escaping after-birth, it should be examined for laceration, and if a tear is found no time should be lost before sending for a doctor to repair it. The parts heal better, the patient feels less, and there is less risk of septic infection, if the rent is promptly stitched; also the woman is spared the anxious waiting for the stitches, which is so trying to her.

As the after-birth comes out, it should be supported to avoid tearing of the membranes. The shape of the last part of the membranes which escapes gives a clue as to whether or not they have been torn. If it is crescentic, they are probably whole and completely expelled; if frayed and pointed, some part has been torn, and most likely a piece is retained in the uterus. The midwife's hand should still remain upon the fundus until, after the delivery of the after-birth, the uterus has again contracted and become firm, small, and hard.

The placenta should next be examined, special care being taken to see that—

1. All parts of the maternal surface fit together, and are of the same height.

2. That the margins are complete, and that there are no broken vessels.

3. That there are no gaps in the membranes, except the one through which the child has come.

Loose ends of broken blood-vessels, a torn margin, some depressed area on the maternal surface, or gaps in the membranes, would mean that something was left behind in the uterus, and that the woman's life was in peril until it had been cleared out.

As soon as it is ascertained that the uterus is empty, the woman should be made clean as quickly and with as little disturbance as possible, and gently lifted into a clean part of the bed. A clean, newly singed or ironed sanitary towel, or sheet of tenax, tow or cotton-wool, should be applied to the vulva, an abdominal binder put on, the clean clothes pulled down, and the woman allowed to rest. She is usually thirsty, and glad to drink an egg and milk, or some such light nourishment. The midwife should count her pulse from time to time. A slow pulse (54 per minute or so) is to be expected, and is a good sign after labour is complete. If, on the other hand, the heart is beating rapidly (90 to 100), something is unsatisfactory; and if the quick pulse is accompanied by a feeling of nausea, hæmorrhage is threatening, and something must be done to stir up uterine contraction. (See chapter on Post-partum Hæmorrhage.)

During the hour which elapses before the midwife leaves the house she should from time to time put her hand upon the abdomen and make sure that the uterus is well contracted, and also see that no undue loss is occurring. These three points—viz., pulse-rate, contraction of uterus, and amount of loss occurring—are of the utmost importance, and unless they are satisfactory, the woman should not be left.

Before leaving the house the midwife should see the person who is going to look after the patient, and give her detailed instructions as to the need for quietness in the room and rest for the patient; also as to how the patient is to be fed, the kind of food she is to have, and the times at which it is to be given. The woman should also be told to wash her hands before she changes the sanitary towels or diapers, and to rub the latter over with a clean, hot iron just before they are applied. This will, if carried out, insure asepsis.

Cases in which Medical Aid must be sought.

1. Malpresentations—that is to say, any presentation other than the uncomplicated vertex or breech; in other words, the midwife should not undertake responsibility for the conduct of any but straightforward cases. This is a hard saying, in view of the difficulty experienced in getting the aid of a doctor in very poor or outlying districts; but until the training of the midwife is extended, she is certainly under a moral as well as this legal obligation to do her utmost to obtain medical aid for such. Another most important point is to learn to recognize abnormalities *early*, in order that there may be time to send for a doctor; and here comes in the need for acquiring skill in abdominal palpation, which will reveal a malposition some time before the presenting part can be reached by the vaginal route.

2. Where no presentation can be made out. Here clearly the midwife does not understand the nature of

the case, and therefore should not undertake it alone.

3. When there is excessive bleeding. Anything more than slight blood-staining before the birth should be regarded as excessive, and should receive timely aid, as it usually means premature separation of the placenta, and is a dangerous condition. After the birth of the child a certain amount of bleeding is natural, but, before it, the only natural source of bleeding is the tearing of small vessels in the neck of the uterus, due to stretching of the parts, and these do not usually bleed much.

4. Where two hours after delivery the placenta and membranes have not been completely expelled. Two hours give ample time for Nature to do the work, if she is capable of doing it, and to leave the placenta or membranes longer in the uterus is to run the risk of post-partum hæmorrhage and sepsis. A very minute piece of retained placenta is enough to set up sepsis; the midwife should therefore be very careful in the carrying out of this rule. Another fact to be borne in mind in this connection is that anything hanging out of the uterus may act as a path along which germs of disease can travel up into that organ. In cases of delay, therefore, the cord should be wrapped in clean material while waiting for the doctor. The same is true also of a leg, arm, or loop of the cord which has prolapsed, and which, if allowed to lie in a pool of liquor amnii, etc., may seriously increase the mother's risks.

5. In serious cases of rupture of the perinæum or of other injuries of the soft parts.

Complete rupture of the perinæum is an extremely serious accident, as when it occurs the rectum and vagina are thrown into one, and it is impossible to keep the vagina aseptic; but any perineal laceration weakens more or less the pelvic supports, and makes it easier for a heavy uterus which has become displaced to prolapse, and also increases the difficulty of treating the prolapse. Midwives often say that they have never seen such a case, but prolapse of the uterus is very common, and is a great aggravation of the weariness which middle-aged and elderly women have to endure, causing, as it does, constant fatigue and dragging pain, as well as the prolapsed organ sometimes becoming ulcerated. If the perineal laceration is so small as to be thought not to require suture (the doctor called in to the case must be the judge of this in every instance), the parts must be kept very clean and at rest, in order that they may heal without suppuration. In cases where there has been prolonged pressure it is necessary to look inside the vagina, and see whether or not its back wall has given way; this sometimes occurs without any external tearing, forming a concealed laceration, and often escaping attention.

A careful search *with a light* should always be made for perineal laceration, for it is a great disgrace to a midwife if, as sometimes happens, the doctor at a hospital (whither the patient has been taken on account of septic infection) discovers a ruptured perinæum which she has overlooked.

CHAPTER VIII

THE PUERPERIUM

THIS term denotes the time occupied by the mother in recovering her health and strength after childbirth. During it certain important processes take place, known as the phenomena of the puerperium, arrest or failure of which results in illness; therefore, during her after-attendance one of the most pressing duties of the midwife is to watch these phenomena, and to recognize the earliest sign of any departure from the normal. The greater number of the ills of this period can be cured if treated in time; but here, as in other branches of the work, the danger lies in overlooking early warning signals, and in allowing mischief to make headway, for after it has once done so it is difficult or impossible to remedy matters. The midwife must also see that the mother and child are kept clean, and must give full directions for securing the comfort and proper dieting of both during this lying-in period, which, according to the C.M.B. regulations and in a normal case, is the time occupied by labour and a period of ten days afterwards.

The important phenomena to be considered are :

1. Involution.
2. The lochia.
3. The pulse and temperature.
4. Lactation.

1. By *involution* is meant the retrogressive change by means of which the large, heavy uterus, having accomplished the work of housing the child during development and expelling it at birth, returns once more to its ordinary resting condition. The uterus which has once borne a child will ever afterwards—at least, during the child-bearing period of life—remain somewhat larger than that of a virgin; also its vessels will remain permanently enlarged; but a very great shrinkage has to take place. The uterus at the close of labour weighs from 24 to 35 ounces, at the end of involution about 1½ ounces; its length just after delivery is 12 or more inches, at the end of involution 3 inches. The size of the uterus should steadily diminish day by day, and the fundus sink lower and lower in the abdomen, until, at the end of the midwife's term of attendance, it should be no longer possible to feel it above the pubes.

At every visit the midwife should feel the fundus, and estimate its distance above the pubes (in inches or finger-breadths). A note of its position should be made daily *in every case*, and if on any day it is found on the same, or a higher, level than on the day preceding, the cause of this departure from the normal should at once be ascertained, and, if possible, removed.

Again, the consistency of the uterus should be estimated, and any tenderness noted. The healthy post-partum uterus goes on contracting, painlessly or nearly so, much as it did during pregnancy, and each contraction leaves its walls firm and hard. Tenderness is an abnormal symptom, and always means mischief.

About the fourth day the uterus may often be noticed to be much softer than on preceding days, but the fundus should always be found and massaged until it hardens under the hand.

A full rectum will push the uterus up and a distended bladder pull it out of its proper position; also a distended bladder will cause tenderness over the front of the abdomen. This must be borne in mind, and the bladder emptied, either naturally or by catheter, when it is causing tenderness or hindering uterine contraction. The midwife should familiarize herself with the feel of a distended bladder, and teach her hands to distinguish between it and an enlarged uterus, as the patient often does not know that her bladder is distended, or what is the cause of the additional discomfort, and the midwife must investigate the matter, and find a means of relieving the pain.

With regard to the rectum, this should not be allowed to become overfilled; it should have been emptied shortly before the birth, and unless there is some special reason to the contrary, such as a badly lacerated perinæum, an aperient should be given on the day following the labour. This has a great effect in quieting the after-pains, of which some patients complain so bitterly.

If, the bladder and rectum being empty, the uterus is still felt too high, there is something wrong.

If the midwife, at the examination of placenta and membranes, was in any doubt as to whether or not all had been expelled, the fact that the uterus is not involuting well is a sign that her worst fears are being realized, and that something has been left behind. She should have found this out before, but, not having done so, must now send for medical aid, in order that the retained portion may be removed. It is much more dangerous now to remove it than would have been the case immediately after delivery, but it must be done, or the woman will die.

If, on the other hand, she was quite certain that placenta and membrane came away entire, the probability is that the woman has excited herself in some way at a time when the uterus was relaxed, that bleeding has occurred into its cavity, and that the blood has been retained there, and formed a clot, and that the latter is hindering uterine contraction. She must now do something to induce the uterus to contract, in order that the clot may be expelled, for otherwise germs of disease will make their way into the uterus from the outer air or decomposing lochia, etc., and cause the clot to decompose, with the result that the patient will suffer from sapræmia.

The first thing to do is to massage the uterus until it begins to contract, and then express the clots, in a downward and backward direction, much as one would express a placenta. If this fails, a hot vaginal douche, given with strict antiseptic precautions, will often

stimulate the uterus and cause expulsion; but if she cannot succeed in emptying the uterus herself, the midwife must call in medical aid.

Oftentimes the uterus in multiparæ seems chronically fatigued and reluctant to contract. This is true also after some cases of prolonged labour, ante- or post-partum hæmorrhage, or where there is an umbilical hernia. In all these cases hot cyllin vaginal douches, given twice a day, together with a mixture containing small doses of liquid extract of ergot (15 minims per dose) and Epsom salts (15 grains per dose), given three times a day for four or five days after labour, help to induce natural involution. The point which cannot be too strongly emphasized is that any arrest of involution is a serious thing and means mischief, and that a very sharp watch must be kept for the earliest sign of it—viz., the uterus remaining the same size on two consecutive days, or being larger to-day than it was yesterday.

If the fundus has not sunk to the level of the pubes by the end of the tenth day the woman should not be allowed up, nor should the midwife discontinue her visits.

During the whole time of involution the woman's excretory organs are in a state of more or less overwork, because it is by these channels, largely, that the waste material caused by involution is carried off. These organs, therefore—viz., skin, lungs, kidneys, and bowels—must be kept in an active condition by cleanliness, fresh air, the drinking of plenty of non-irritating fluid, and, if necessary, by aperients, and

must be spared extra strain, such as would be put upon them by chills, stuffy atmosphere, a too concentrated diet, indigestion, or constipation.

Other things being equal, those who feed their infants naturally pass through this period much more healthily than those who do not.

Involution is not complete until eight or nine weeks after delivery. During this time the woman should be advised to rest a little each day (best lying down), and should only very gradually return to her ordinary work; she should also be spared any excessive strain, such as lifting heavy weights or prolonged standing, especially in cold or damp places, which would tend to cause subinvolution (to be described presently), a condition extremely common amongst mothers of the working class. The Factory Act allows women to return to their work after the expiration of one month from delivery; but many mothers are totally unfit for hard work so soon after their great strain, and by returning to it lay up for themselves a store of invalidism which lasts for many years, or even for life. We hope that this Act may be amended in the future, and conditions so arranged that poor mothers may be spared this terrible strain, and their infants given the benefit of maternal care and natural feeding.

Midwives can often do much to better the conditions of the hard-working mother by pointing out to a heedless husband and to elder children the need for sparing and showing special kindness to the poor hard-working woman during the time of weakness which follows the birth of a child.

Subinvolution is imperfect involution. Instead of becoming smaller, the uterus remains large and heavy; bleeding occurs again and again, and the interior of the uterus remains in an unhealthy condition. Besides this, the organ, being heavier than it should be, tends to fall backwards in the pelvis, and then slip downwards; and if, in addition, the woman has heavy weights to lift, much standing, a winter cough, or her passages have become wide and lax through much child-bearing, the uterus may come quite out through the vaginal opening, and the patient suffer from 'falling of the womb.'

The surest means of prevention is care during the puerperium, sufficiently long rest in bed, and avoidance of strain until the uterus has gone back to its normal size. If the condition is actually present, a doctor should be called in or the patient taken to hospital, as prolonged and careful treatment is required for its cure.

2. *The Lochia.*—These may be regarded as the discharge from the placental wound mixed with more or less blood, mucus, and shreds of the decidua. The total amount lost varies from 10 ounces to 3 or 4 pounds. Women who suckle their infants lose less than those who do not, and the character of the discharge varies from day to day. At first it is red, almost pure blood for three or four days; then paler, the blood being mixed with watery fluid; then greenish or whitish, and gradually ceasing altogether.

The lochia should be closely watched for any departure from the normal, and daily inquiry made as

to the number of diapers used, their state of saturation or otherwise, and the answers received should be checked by what the midwife herself sees, smells, and feels.

The natural smell of lochia is faint and characteristic, but not fœtid, and foul-smelling discharge means mischief. Too early sitting up will cause recurrence of bleeding, and if, in addition, the uterus is flabby, the blood will be retained, clot, and hinder involution, and, as mentioned above, it is liable to decompose and set up sepsis. The lochia putrefy very readily, and when allowed to accumulate form excellent breeding-ground for the germs of disease. The parts, therefore, must be kept well washed and swabbed with cyllin lotion, or some other antiseptic, and frequent changes of diapers or pads provided. If there is any offensive smell after the ordinary cleansing has been done, an antiseptic vaginal douche should be given to wash out any lochia which may have accumulated there; and if the foul smell persists after this, the midwife is bound by her rules to advise that a doctor be sent for.

Too early stoppage of the lochial flow usually means mischief, especially if the cessation is sudden; and the case is certainly doing badly if tenderness of the part is also present, and if temperature and pulse-rate are increased.

3. *The Pulse and Temperature.*—During labour, especially during the time of greatest strain, the heart has been beating more quickly than usual—*i.e.*, it has been doing extra work; therefore, after the strain is

over it is natural that it should require rest. The heart can never have absolute rest so long as life goes on—from birth to death it works at the rate of eight hours a day, without a single holiday—but its work is less hard when the pulse-rate falls, and Nature usually arranges for it to have this relative rest after the strain of labour is over. Hence it is usual for the pulse of the newly delivered woman to be slow—some fifty-four to sixty beats per minute, or less than this. When, on the other hand, it is quick, and remains so, unless the increased rate can be accounted for by some condition apart from the puerperal state, we suspect mischief, and this suspicion becomes a certainty if there are other symptoms of illness or delayed involution. Rapidity of pulse-rate, however, often stands out as the only symptom that all is not well for many hours before other signs become apparent. For this reason the pulse should be counted at every visit, and a note made of its rate. If the case is going to be one of septicæmia due to infection at or before birth, the temperature will begin to rise twenty-four or more hours later; or if the patient is becoming sapræmic, there will soon be softness and flabbiness of the uterus, with tenderness, followed by rise of temperature. But the rise of pulse-rate is the first danger-signal; next an arrest of involution occurs, and later a rise of temperature.

Excitement, worry, constipation, a full bladder, tension in the breasts, indigestion, or errors of diet, are all liable to cause increased pulse-rate; but when due to these causes, the rate becomes slower with

removal of the exciting cause. Consumption or influenza, or some other general disease, may cause a persistently rapid pulse; but if it cannot be accounted for in some such way, the quick pulse should be taken as a warning that sepsis is threatening.

A pulse-rate above eighty per minute is undesirable, but when it is above one hundred for any length of time there is serious ground for apprehension. The temperature should be taken and noted upon a chart at each visit, but if there are other symptoms of illness the rise of temperature should not be waited for before sending for medical aid.

The normal temperature is 98·4° F., and it may vary between this and 99·6° or 99·8° F. during the early days of the puerperium without danger. When it reaches 100° F., and stays there for any length of time, however, it usually means mischief; and if it remains at 100·4° F, with increase of pulse-rate, for twenty-four hours, a doctor must be called in. Medical aid is also required when a rigor (prolonged shivering) occurs with any rise of temperature.

4. *Lactation* means the secretion of milk by the breasts. The first secretion from the breasts is not true milk, but a fatty material (colostrum), which acts as a natural aperient to the infant, and helps it to get rid of the meconium (the blackish-green material which is discharged from the rectum during the first day or two of life). The milk proper usually begins to be abundant about the third day, and at the same time the breasts become hot, tender, and hard, and the mother feels stuffy and uncomfortable;

also a transient rise of temperature and increase in pulse-rate are noted.

The nipples should have been prepared for their duties during the later months of pregnancy, as described in the chapter upon that subject, and as soon after birth as the mother can bear it they should be washed, and the child put to the breast; this will have the double effect of setting up uterine contraction and giving the child the benefit of the colostrum prepared for its use. The breast should be lifted up, and the nipple made to protrude as it is presented to the baby, in order that the latter may be able to seize it readily; also the child should be so held that during suckling its nostrils are free for breathing purposes; otherwise it will let the nipple go when it requires to breathe, and there may be difficulty in making it take it again. The child should be put to the breast every four hours in the daytime during the first two or three days, until the flow of milk is established, and then once in two hours during the day and once in four hours at night. Strict punctuality is very important in this matter. When the milk is scanty or poor in quality the quantity can be increased by giving the mother more fluid to drink, and the quality by giving her a more generous diet.

Cracked nipples can usually be avoided by careful preparation before labour, and by cleansing them and the infant's mouth before and after each nursing; but when the nipples are being washed, they should always be examined for any soreness or cracking, and if such is found the sore place should be treated with Friar's

Balsam, applied with a little mop of clean cotton-wool. If some such treatment is not carried out, the germs of pus formation will find their way through the crack into the substance of the breast, and cause an abscess there. With ordinary care no such trouble should occur during the puerperium, but if it does the midwife should never attempt to treat it by poulticing, etc., but should send at once for a doctor. If pus has formed there it must be let out; for a clean cut made by the surgeon's knife, kept properly dressed, has a much better chance of healing quickly than the wound which results from the bursting of an abscess, which often takes months to heal.

If the child is too feeble to take the breast, the milk should be drawn off by the breast-pump at regular intervals, and given to it with a spoon; but wherever it is possible the child should be made to take its food directly from the breast, as spoon-feeding pauperizes the muscles of its mouth and tongue, by relieving them from the necessity of working to secure the nourishment provided.

A hot fomentation applied to the breast will give much relief in those cases in which the coming in of the milk is accompanied by pain and tension.

When the child is born dead an endeavour should be made to prevent or limit the secretion of milk by applying pressure to the breasts, lessening the amount of fluid taken by the mother, and giving saline aperients to drain away some of the fluid already in the circulation. This should be begun as soon as possible after the child's birth.

A very good way of applying pressure is to cut circular pieces of lint to fit the breasts, with holes in the middle, through which the nipples can pass. After the breasts have been washed, several of these are put on one upon the other, until they are level with the top of the nipple, then one without a hole; the hollows between and around the breasts are next filled up with cotton-wool, until the whole is level; a sheet of cotton-wool is put over all, and a binder applied around the chest as tightly as is possible without causing pain. There is often some pain on the third day, but unless this is excessive the bandage should not be removed, as the pressure is then more than ever necessary to limit secretion. At the end of about a week the breasts will probably have given up the attempt to secrete, and the bandage can be discarded; but if they still remain swollen and any leakage is occurring, it should be reapplied. There must be no drawing off of the milk, no massage of the breasts, nor any other manipulation which would encourage secretion.

Epsom salts or one of the effervescing salines should be given daily, until all signs of milk secretion have passed off. If salts are given, 2 teaspoonfuls of the crystals may be dissolved in a cup of tea, and given before breakfast: the tea well disguises the unpleasant taste. The effervescing salines, if used, should be given in rather larger doses, dissolved in warm water.

Diet during the Puerperium.—Soon after labour is over some fluid nourishment should be given. A new-laid egg beaten up with milk is a very suitable form for it to take. Well-boiled gruel with plenty of milk

is good later, and tea and bread and butter, if the patient fancies it. It is best to keep her upon light diet, without meat, until after the bowels have been well relieved, then more substantial articles can be added, one by one, as the patient is able to digest them. The more generous the diet, the sooner will she regain strength; but the limit of digestion must never be passed, and all doubtful articles, as regards digestibility or freshness, must be prohibited—for example, shell-fish, pork, sausages, meat-pies, pastry, cheese, unripe or over-ripe fruit, or fish or vegetables which have been in the house some days. Alcohol in any form should be avoided, unless given for some special purpose under medical advice.

5. *After-Pains.*—A fixed or continuous pain in the abdomen must never be lightly treated and called an after-pain; such pain, if present, is always due to some serious cause, which must be found and treated. Neglect to distinguish between these two classes of pain has resulted in many deaths, serious conditions having been allowed to go untreated until the patient had passed beyond human aid. The only after-pains rightly so called are intermittent in character—*i.e.*, they come and go something like labour pains, and are best treated by a timely aperient, and ½ teaspoonful of liquid extract of ergot in a wineglassful of water, repeated once in six hours for two or three doses; but if there is any doubt as to the true character of the pain in any case, a doctor should be consulted. While waiting for the doctor, a hot fomentation over the front of the abdomen gives relief.

6. *Retention of Urine.*—This may be due to bruising of the urethra or neighbouring tissues by long-continued pressure of the presenting part during tedious labour, or to injury resulting from instrumental delivery, etc.; it may be caused by lack of tone in the muscle forming the wall of the bladder, or simply by nervousness on the part of the patient. Whatever its cause, it must be relieved, and, if possible, by natural means. Often a little persuasion is all that is required, but, if other measures fail, a catheter must be passed, boiled immediately before use, and before passing it the urethral orifice must be *seen*. It lies in the vestibule between the lesser lips of the vulva. Sometimes it is obscured by swelling, drawn up out of sight, or hidden by a papilla lying over it. When drawn up out of sight, an aseptic finger placed inside the vagina and drawn gently downwards along its front wall will usually bring the urethral opening into view. If a papilla is obscuring it, this must be displaced by an aseptic finger, and the urethra will be found beneath. When the flow of urine from the catheter has ceased, the point of the instrument should be moved about a little in the bladder before withdrawing it; this will often cause the flow to start afresh. When it has finally stopped, the end of the catheter should be closed with the thumb (or, if it is of indiarubber, by pinching), to prevent soiling the parts by the outflow of urine contained in the catheter. Occasionally, especially after complicated labour, instead of flowing through the natural passage, urine is found dribbling from the vagina; this points to the

presence of some wound, in either bladder or urethra, which has caused a communication between it and the vagina. The condition is serious, and should receive medical aid.

Before leaving this subject let it be noted that the woman should not be allowed to sit or kneel to pass her urine until at least thirty-six hours have elapsed since her delivery, also that any failure to secure asepsis in the use of the catheter is apt to lead to septic inflammation of the interior of the bladder (cystitis).

7. *Rest.*—The woman should be kept in bed for at least ten days (a fortnight is better), lead an easy life for a month, and undergo no severe strain for at least two months. If the uterus is slow to involute, she should stay in bed until it can no longer be felt in the abdomen; and if on rising the red discharge comes on again, she should go back to bed and stay there until it has ceased.

Cleanliness.—The necessity for this has been fully discussed above, but, lest what has been said should be forgotten, be it here remarked that to know how to be clean and to apply the knowledge is in ordinary midwifery far more important than the possession of special skill in manipulation; for in the great majority of cases Nature effects all that is required without much outside help.

Visiting.—In view of the important nature of her work during the puerperium, and the strict watch required to detect the earliest signs of departure from the normal in the condition of the patient, it must have become clear that the ordinary amount of visiting

done by the busy midwife who has a large practice is totally inadequate, and the fact that women receive such scanty attendance after their confinement no doubt explains the crowded condition of the hospitals for women.

One has heard it said even by an educated and very well trained midwife that the case is over when delivery is complete. This is by no means so. Mischief, resulting in lifelong invalidism, often originates, not so much at the time of labour as during the puerperium, and the midwife should not consider her duty satisfactorily performed (in the case of a healthy woman who has had a normal confinement) unless the patient, after the puerperium, is able to return to her duties in as good a condition as regards health and general soundness as that in which she was before her pregnancy.

The work of the midwife is unlike that of any other variety of nurse, inasmuch as in it service faithfully rendered, or, on the other hand, mistakes made, whether through ignorance, hurry, or wilful negligence, have consequences which are exceedingly far-reaching. The life of the mother is entrusted to her care—the most valuable life in the household; the life which should have the most important influence for good upon those of husband and children. Upon her depend their home surroundings, and to a great extent their health, strength, and happiness. She has a powerful hand in fashioning the future of the children for good or ill, and with mothers, taken collectively, largely rests the future of the nation. Nothing spoils

home life more certainly (especially in the homes of the poor, where little outside aid can be afforded) than illness or enfeeblement of the mother during her children's early life, and such illness is very common and often traceable to a mismanaged confinement. The question of providing adequate attendance is one of much difficulty, for most of the midwives require to earn a living, and to do so, when the fees paid them are so small and uncertain as they are at present, often obliges them to undertake more work than they can conscientiously perform. Possibly the revisers of the Midwives Act may find a way out of the difficulty, but in the meantime the midwife must be content to be overworked rather than that her patients should suffer.

The first visit should be paid within eight, or at most twelve, hours of delivery; morning and evening visits are desirable for the next three days, daily visits for the remainder of the week, and if all is going well two visits on alternate days may suffice afterwards. In bad cases daily visits or visits twice a day are required for a fortnight or longer.

At every visit in a normal case the pulse, temperature, involution of the uterus, and character of the discharges, should be examined and noted. The genitals should be washed and disinfected, the abdomen massaged, and the nipples examined.

Inquiry should be made as to sleep, the amount of food taken, the state of the bowels, and the amount of urine passed; also, when necessary, directions given as to food and aperients. The child also must receive attention, but this is discussed elsewhere.

CHAPTER IX

TWINS

TWINS result from the fertilization of two ova or of one ovum containing two germs. If the former, there are two placentæ and two complete sets of membranes; if the latter, there is one placenta and chorion and two amnions.

In 50 per cent. of the cases both children present by the head; in 30 per cent. one by the head and the other by the breech; more rarely both by the breech, and still more rarely one presents by the head or the breech and the other lies transversely.

Labour in twin pregnancy is usually slow, for the presence of over-distension lessens the uterine force; also the latter has to be transmitted through the second child to the first, and loses part of its power in the transmission.

On the other hand, twins are usually small and often born prematurely; therefore less force is required for their expulsion. Twin pregnancy increases the risks for both mother and children.

The mother runs increased risk from—

1. Delay, which may lead to exhaustion and increased liability to post-partum hæmorrhage, sepsis, or subinvolution.

2. Malposition or locking. If these conditions be present, they are attended by the special dangers of the condition and of the manipulations necessary for effecting delivery.

3. Increased liability to suffer from eclampsia.

The risks to the children are :

1. From prematurity or immaturity : one is sometimes nourished at the expense of the other.

2. From locking: one head may come down in extension, and a second head, following quickly, become impacted between the chin and chest of the first child, and form an immovable block. Again, one child may be partly born by the breech, and its head, having become locked between the chin and chest of the second, which is advancing at the same time, may be unable to be born. Or the body of a child lying transversely may be thrown across the chest of one partly born by the breech, and prevent the birth of its head.

3. From the usual dangers arising from malposition, delay, and manipulation required for effecting delivery.

In spite of all these risks, however, twin births usually do well, both children being born alive, and the mother making a perfect recovery.

Diagnosis.—The intelligent mother often makes this for herself. On examination the abdomen is usually larger than in single pregnancy, and under favourable conditions parts of two children can be felt, and if they are both alive two fœtal hearts heard beating at different rates at different parts of the abdomen.

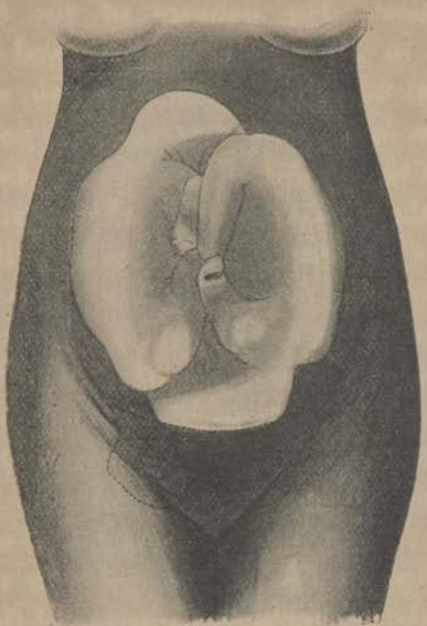

FIG. 20.—TWINS PRESENTING BY THE VERTEX AND BREECH AS FELT BY ABDOMINAL PALPATION. (Jellett's 'Manual of Midwifery.')

The unshaded portions of the infants are those which are felt most distinctly.

Another important guide is that on vaginal examination the presenting part is much too small to account for the very large abdomen. Nevertheless, the diagnosis is often not made until after the delivery of the first child.

Management.—The delivery of the first child is conducted in the ordinary way, and the mother having been told to lie upon her back, an abdominal examination is made to determine the position of the second. If the position is good and no bleeding going on, the mother should be allowed to rest for half an hour, and, if she feels inclined to take it, some fluid nourishment should be given her. She should also, for her encouragement, be told that the second child will be born much more easily than was the first.

If at the end of half an hour labour pains have not begun again, the midwife should, with more than ordinary care, disinfect her hand and rupture the membranes; this will cause the pains to come on with renewed vigour, and delivery will be rapidly completed. Labour should be so managed that the child is not born too suddenly or in the absence of contraction; otherwise, the empty uterus being left flaccid, bleeding will take place.

The third stage of labour in twin cases needs careful management. When the placenta is very large there is often some delay in its expulsion, and sometimes considerable loss of blood; provided, however, that the hand has controlled the fundus well from the beginning of the third stage, the placenta can usually be quite easily expressed by the method given in an

FIG. 21.—TWINS PRESENTING BY THE VERTEX.
(Jellett's 'Manual of Midwifery.')

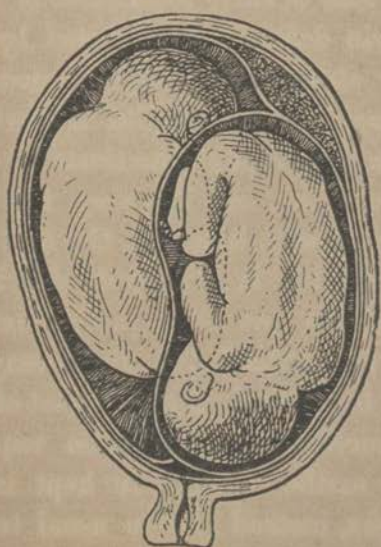

FIG. 22.—TWINS PRESENTING BY VERTEX AND BREECH.
(Jellett's 'Manual of Midwifery.')

earlier chapter. Also, since the uterus has been over-distended, its contractile power is impaired, and special care required to assist its efforts; otherwise internal bleeding occurs, clots form, and tend to be retained and decompose. If after emptying it is found to be persistently flabby, a hot vaginal douche should be given, and one, two, or, if necessary, three 1-drachm doses of ergot (ammoniated tincture) given at intervals of twenty minutes. In the exceptional case where a separate placenta follows the birth of the first child the patient should be made comfortable, and no attempt be made to hurry on the second labour. It may be that the other child belongs to a separate period of gestation, and will not be ready for birth for some time. The midwife should wait at least an hour, and be within call in case of early recurrence of labour pains.

Cases of twin delivery complicated by malposition, or any other abnormality, require medical aid. In cases of locking where one child is partly born and still alive, the heads may sometimes be disentangled by pushing one up and drawing the other down *between pains;* usually, however, the first child has to be sacrificed, and if it is already dead it is better that the midwife should not attempt this manœuvre, but send at once for medical aid, which may be able to save the life of the second child and that of the mother.

The after-nursing of twin cases requires special care, and the mother should be kept in bed for at least a fortnight, instead of the usual ten days, and longer if the uterus has not sunk to the level of the pubes and if all red discharge has not ceased.

FIG. 23.—TWINS LYING TRANSVERSELY.
(Jellett's 'Manual of Midwifery.')

FIG. 24.—TWINS PRESENTING BY BREECH AND BACK.
(Jellett's 'Manual of Midwifery.')

CHAPTER X

DORSO-POSTERIOR POSITIONS

BEFORE entering upon the consideration of some of the abnormalities apt to occur in midwifery practice, let it be clearly understood that, although in the following pages the method of treating various complex conditions is given, the midwife is urged to do her utmost in every instance of difficulty or danger to secure medical aid for her patient, and that it is only in emergency, and when such aid cannot possibly be obtained, that she should try to manage abnormal cases.

When the child lies with its front surface towards the front of the mother, it does not fit so well the uterine and abdominal cavities as when its back is directed forwards. The natural attitude of flexion is therefore apt to fail, with the result that, if the neck is fully extended, we have a face presentation; if it is partly extended, the child presents by the brow; if flexion is imperfect, a persistent occipito-posterior position, or face-to-pubes case, may result; if flexion is complete, the occiput undergoes long internal rotation, coming forward through three-eighths of a circle, and the case ends as a second or first vertex.

Diagnosis.—This should be made by abdominal

FIG. 25.—DIAGRAM REPRESENTING THE FŒTUS AS FELT BY ABDOMINAL PALPATION IN VERTEX PRESENTATION; BACK BEHIND. (Jellett's 'Manual of Midwifery.')

The unshaded portions of the fœtus are those which are felt most distinctly.

palpation. On examining the umbilical region of the mother, movable knobs, corresponding to the knees and elbows, will be felt, instead of the smooth curve of the back. It is important that the condition be made out early, as it is accompanied by increased danger to both mother and child, and the necessary manipulations for setting matters right can be carried out much more easily and safely before than after rupture of the membranes.

Having made out the position, the midwife should at once advise that a doctor be sent for, in accordance with Rule 19, 3 ; and, when a doctor is coming, it is best to avoid vaginal examination, which might result in rupture of the membranes.

In view, however, of the latter part of Rule 18, the midwife may be left to manage the case alone, and therefore, in order to do her best for the patient, she should thoroughly understand the mechanism, and know something of the treatment of such cases.

Face-to-Pubes Cases, or Unreduced Occipito-Posterior Positions.

Here the occiput lies towards the mother's sacro-iliac joint (left or right), and the forehead towards her opposite foramen ovale, the sagittal suture being in the oblique diameter of the pelvis at its inlet. The head then undergoes internal rotation, the occiput passing backwards into the hollow of the sacrum, and the forehead becoming fixed beneath the pubic arch; the head, being driven onwards by the

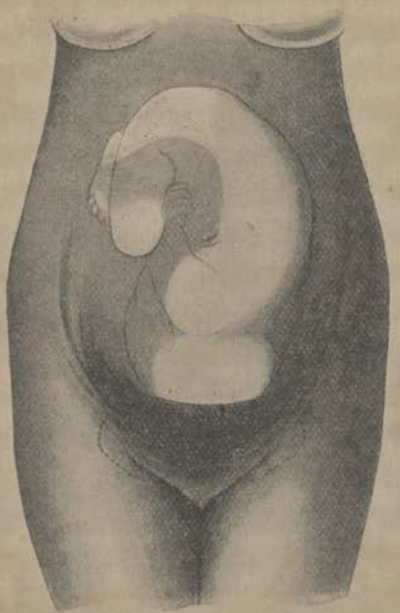

FIG. 26.—DIAGRAM REPRESENTING THE FŒTUS AS FELT BY ABDOMINAL PALPATION IN VERTEX PRESENTATION; BACK IN FRONT. (Jellett's 'Manual of Midwifery.')

The unshaded portions of the fœtus are those which are felt most distinctly.

force of uterine contraction, descends and distends the perinæum, and is born by flexion.

In these cases there is always delay, because, the head being imperfectly flexed, a longer diameter (the occipito-frontal) is thrown across the pelvis, and more force is required to drive it through. Again, when the head is large or the pelvis small, this diameter cannot pass, and both mother and child are in imminent danger from impaction. Even when—the head being small and the pelvis large—birth occurs spontaneously, there is greatly increased danger of laceration of the perinæum, because the fronto-occipital diameter in escaping puts a much greater strain upon the perinæum than the suboccipito-bregmatic.

Diagnosis.—The position of the child has already been made out from abdominal palpation, and on early vaginal examination the head lies high in the pelvis, and is difficult to reach; later the anterior lozenge-shaped fontanelle, instead of the usual three-rayed star of sutures, can be felt presenting in front.

Treatment.—If seen early, before rupture of the membranes, the position may be altered by manipulation through the abdominal wall; but in order to do this the exact state of affairs must be made out, and the child's anterior shoulder defined. For the examination and manipulation the patient should lie upon her back, with knees bent, in order to relax the abdominal muscles. Suppose the child to lie in the third position—*i.e.*, with its occiput behind and towards the mother's right—its left shoulder will then

be anterior, and also towards the right of the mother. The midwife's hand should be placed behind this shoulder, and by a series of gentle pushes bring it forward, towards and then beyond the middle line. The head will come with the shoulders, and now the occiput will be in front and towards the mother's right —*i.e.*, a third position will have been converted into a second. It is necessary to give several pushes to the shoulder, bringing it forward with one hand and pushing it over to the opposite side with the other. Each push seems to have little or no effect, as one is working through the thickness of both the abdominal and uterine walls; but by perseverance, if the head is above the brim, the patient not too fat, and the abdominal muscles well relaxed, the change of position can usually be brought about.

The position being satisfactory, a tight binder should be applied.

If the case is not seen until after the membranes have ruptured, and the head is well down, a chance should be given for Nature to effect change of position. The patient should be made to lie upon the opposite side in the semiprone posture, in the hope that the uterus may swing over by its own weight, and the child come to lie in a dorso-anterior position. This will be aided if, during a pain, the forehead be pressed upwards and backwards to promote flexion.

Failing this, the change must be effected by a combination of abdominal and vaginal manipulation. The left hand, cleansed and disinfected to the elbow, should be inserted into the vagina, and, in the interval

between two pains, the head, taken between the thumb and fingers, should be turned towards the front of the mother, the forehead at the same time being pushed upwards and backwards—*i.e.*, the head is flexed, and the occiput made to rotate forwards. The right hand meanwhile, placed upon the abdomen, brings the anterior shoulder forward, and pushes it over towards the opposite side. A tight binder should now be applied, and the patient kept upon her back until the head begins to distend the perinæum, when she should be placed upon her side, and the case conducted in the usual way.

Face Presentation.

Causes.—Anything which produces extension of the neck will tend to cause face presentation. Among the commoner causes are the following:

Flattened pelvis.

Obliquity of the uterus, especially when the child is in the third or right dorso-anterior position, and the uterus, as is usually the case, leans towards the right.

Presence of twins. All kinds of faulty presentations are apt to occur here, face among the others.

Overdistension of uterus by excess of liquor amnii, tumours, etc.

Death, prematurity, or smallness of child.

An unduly large or misshapen head, as, for example, hydrocephalic.

Fœtal deformity—*e.g.*, anencephalus, tumours of neck, etc.

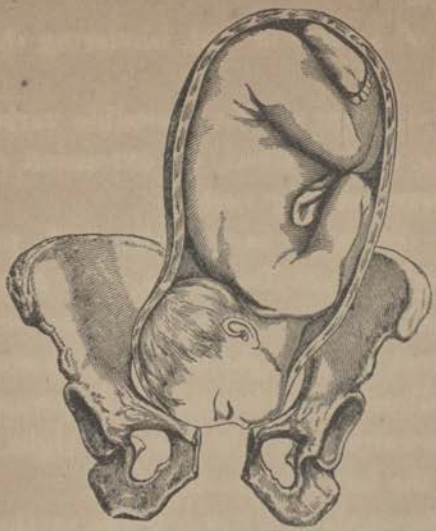

FIG. 27.—PRESENTATION OF THE FACE AT THE PELVIC BRIM IN A POSITION INTERMEDIATE BETWEEN SECOND AND THIRD. (Galabin's 'Midwifery.')

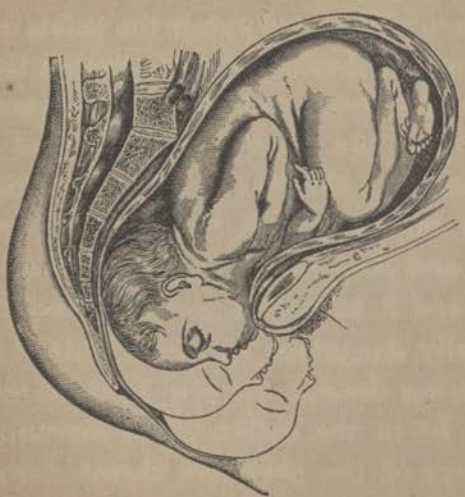

FIG. 28.—PASSAGE OF THE HEAD UNDER THE PUBIC ARCH BY A MOVEMENT OF FLEXION IN FACE PRESENTATION. (Galabin's 'Midwifery.')

Short cord.

Prolapse of a hand or foot, hindering the descent of the occiput.

Varieties.—There are four possible varieties of face presentation, each derived, by extension of the neck, from the corresponding vertex:

1. Chin directed backwards and towards the mother's right sacro-iliac joint, the forehead being forwards and towards her left foramen ovale, the line of the features in the right oblique diameter.

2. Chin directed backwards and towards the left, forehead forwards and towards the right, and line of features in the left oblique diameter.

3. Chin forwards and towards the mother's left.

4. Chin forwards and towards her right.

Of these the third is the commonest, and will be more fully described.

Mechanism.—The head enters the pelvis in a position of extension, the forehead lying towards the mother's right sacro-iliac joint and the chin towards the left foramen ovale. As it descends the head undergoes internal rotation; the chin, passing forwards, comes to lie beneath the pubic arch, the forehead distends the perinæum, and the head is born by flexion.

Cases 1 and 2, known as mento-posterior positions, are especially dangerous for both mother and child, because during descent the chin tends to rotate backwards and lie in the hollow of the sacrum; the neck and shoulders of the child are thrust down into the pelvis before any part is born, and the whole forms a block which the natural powers are insufficient to

expel. Thus, unless skilled aid is available, both mother and child die.

Dangers to the Mother.—Even in favourable cases there is usually delay and increased liability to exhaustion and the complications of the puerperium—viz., post-partum hæmorrhage and septic infection.

In complicated cases there is also increased shock and danger from the operation of extraction. Danger from this cause is slight if medical skill is early brought to bear upon the case, but increases enormously with delay; hence the need for promptness in finding out the condition and in sending for medical aid. A third danger is the one mentioned above—viz., impaction—in unreduced mento-posterior cases, and death of both mother and child.

Dangers to the child are also threefold—viz., from

Delay.
Method of extraction.
Death before delivery.

Diagnosis.—This should be made by the ordinary methods.

The position of child will be found by abdominal palpation, and, on making the pelvic grip, the chin will be felt to one side, and the occiput, at a higher level, on the other.

On early vaginal examination, the presentation will be high and difficult to reach, also the bag of membranes will be sausage-shaped instead of saucer-shaped, as in vertex presentation.

Later the features can be made out, and the bony

ridges above the eyes and the presence of jaws within the mouth will serve to distinguish the face from the breech, for which it has sometimes been mistaken.

On becoming aware of the condition, the first thing to do is to send for a doctor, and if she suspects a face presentation the midwife should do this before she makes a vaginal examination, leaving the latter to the doctor, since each examination increases the risk of premature rupture of the membranes, and when these are gone a valuable dilator is lost. The patient while waiting for the doctor should lie upon her side, and all bearing-down efforts should be forbidden.

In case of the third or right dorso-posterior position, where the uterus is oblique towards the right, the patient should lie upon the left side, and this of itself may be enough to rectify the faulty position, the uterus swinging over to the required place by its own weight.

If no doctor can be obtained, the midwife should then, the uterus having swung over, ascertain the state of affairs by vaginal examination. If the face still presents, she should, in the interval of pains, press up the chin and then the forehead; this will cause the occiput to descend, and the child will be delivered by vertex.

If the membranes have ruptured, and the face is coming down with the chin in front, the case should be left to Nature, the patient being kept upon her back until just before delivery.

If the membranes are ruptured, and the chin is towards the mother's back, the disinfected left hand

should be passed into the vagina, the face taken between the fingers and thumb, and the chin turned forwards in the interval of pains, the right hand upon the mother's abdomen at the same time turning the body of the child in the same direction.

Brow Presentations.

These are produced when the head enters the pelvis in a semiflexed position. They very rarely deliver themselves, on account of the fact that the longest diameter of the child's head—namely, the vertico-mental (from the top of the head to the tip of the chin)—is thrown across the pelvis, and this is too long to pass through.

There are four possible varieties, all derived by semi-extension from the corresponding vertex presentations. In every case medical aid should be obtained, if possible.

Diagnosis.—On making the pelvic grip the chin is felt on one side of the pelvis and the occiput on the other *at the same level*, and, on vaginal examination, the smooth frontal bone is felt, leading in the one direction to the supra-orbital ridges, and in the other to the diamond-shaped anterior fontanelle.

Treatment.—If confronted with such a case when medical aid is unobtainable, the choice of the midwife must be between turning it into a vertex presentation and a face, and her guide will be the position in which she feels the supra-orbital ridges. If these are behind she should press the face upwards and backwards, and bring the occiput down in front; this will convert the

case into a first or second vertex, which is a favourable presentation. On the other hand, if the supra-orbital ridges are in front, she should press up the head and bring down the chin ; this will convert the presentation into a third or fourth face, which are also favourable. To do the opposite would produce occipito-posterior or mento-posterior positions, which are both unfavourable.

If a doctor arrives in time, he or she may decide to turn the child and deliver by breech.

CHAPTER XI

PELVIC PRESENTATIONS

THESE are rare in primiparæ, occurring about once in eighty deliveries; more frequent in multiparæ—about one in twenty-three.

Causes.

1. Any condition which prevents the settling of the head into the pelvis—*e.g.*:

Flattened pelvis. Here breech presentation has a distinct advantage, for the after-coming head moulds more readily. Knee and footling presentations often occur in this condition.

Pendulous abdomen. The fœtus tends to lie obliquely in the lax abdomen, and if its pelvic pole is lower than the cephalic (or head end), a pelvic presentation results.

Pelvic tumours, hydrocephalus, fœtal monstrosity, or *short cord.*

2. *Conditions of overdistension of the uterus,* as by excess or liquor amnii (hydramnios) or twins (although twins often both present by the head).

3. Any circumstance which diminishes the normal tone or stiffness of the fœtus, or hinders flexion, or

allows the fœtus too much space—*e.g.*, prematurity, immaturity, or death (the dead fœtus, instead of forming a compact ovoid figure, which fits accurately into its allotted space, is more or less flabby and extended, and a vigorous uterine contraction thrusts any part which happens to be near into the pelvic brim). Footling and cord presentations are frequent in these cases.

Hydrocephalus acts in two ways—it alters the specific gravity of the head, causing it to rise in the liquor amnii, and also prevents its settling into the brim if it is placed over it.

Excess of liquor amnii gives the fœtus too much room in which to move about, and permits it to become extended.

In a certain small number of cases no cause can be assigned.

Varieties.

1. *Complete* pelvic presentations, where the breech and feet descend together.

2. *Incomplete*—(*a*) where the breech alone presents, the legs being extended and lying near the shoulders; (*b*) where one or both feet or knees descend in advance of the breech.

Of these the incomplete are the more serious, since, as will be seen later, they are apt to be complicated.

There are four positions, named left and right sacro-anterior and right and left sacro-posterior respectively. To the practising midwife these terms need no explanation.

FIG. 29.—DIAGRAM REPRESENTING THE FŒTUS AS FELT BY ABDOMINAL PALPATION IN PELVIC PRESENTATION. (Jellett's 'Manual of Midwifery.')

The unshaded portions of the fœtus are those that are felt most distinctly.

Usual Progress of Case.

Breech deliveries, if an average of all cases be taken, occupy a shorter time than vertex—this is due to the fact that so many of the children (some 20 per cent.) are born prematurely—but delivery at term is apt to be longer than in head-first cases.

Delay is often considerable in primiparæ, because the elongated bag of membranes found in breech cases, besides being a less efficient dilator than the hemispherical bag in vertex births, is apt to rupture early, allowing the liquor amnii to drain away before the soft parts are fully opened, and the breech is not so good a dilator as the head.

Delay in the second stage may be caused by one of the following conditions :

1. *Impaction* due to—

(*a*) Smallness of pelvis in relation to size of child.

(*b*) Extension of fœtal legs upon the body in such a way that body and legs form a wedge which is too large to be driven through the pelvis.

2. Extension of arms.

3. Extension of head.

4. Incomplete opening of the cervix, which keeps back the head after the child is partly born. This is apt to occur in premature delivery when the head of the child is large in proportion to its body.

Dangers to the Mother.

In uncomplicated cases these are not greater than in vertex delivery, and in cases conducted wholly by

FIG. 30.—FIRST OR LEFT SACRO-ANTERIOR POSITION OF THE BREECH. (Galabin's 'Midwifery.')

FIG. 31.—PASSAGE OF BREECH UNDER PUBIC ARCH BY A MOVEMENT OF LATERAL FLEXION; SECOND POSITION. (Galabin's 'Midwifery.')

Nature, or with the minimum of assistance, injury to the soft parts is less likely to occur than in head-first cases conducted in the same way.

When there is need for assistance, the presence or absence of danger depends upon the skill of the attendant and upon the stage at which aid arrives.

When the body of the child is born before full dilatation of the cervix uteri, tearing of the latter is apt to occur, due to hasty delivery of the head.

In cases of impaction there is the danger that, *if* assistance is delayed, either the uterus will rupture or the mother die from exhaustion before delivery. Whenever there has been difficulty and delay, with need for much interference, the shock and exhaustion of labour are increased, and the patient is, on this account, predisposed to the accidents of the puerperium—viz., *post-partum hæmorrhage* (especially if an exhausted uterus has been suddenly emptied), *delayed involution*, and *sepsis* (particularly if there has been any flaw in the matter of cleanliness or antiseptic precaution).

The patient, therefore, requires greater care, longer rest in bed, and often special treatment, directed to aid tired Nature during the process of involution.

Dangers to the Child.

These are distinctly greater than in vertex delivery, and their gravity depends largely upon the skill of the attendant and the stage of labour at which aid is available.

The number of infants stillborn varies between 10 and 30 per cent.

Accidents arise out of delay or from the means taken to hasten delivery.

They are:

1. *Pressure upon the cord,* and resulting asphyxia, due to stoppage of circulation of blood in its vessels and the cutting off of the air-supply to the fœtus. This danger is greater in large than in small children, for there is less room in the pelvis; greatest in footling cases, for the cord is apt to prolapse, and pressure to begin earlier; more acute after the child is born as far as the umbilicus than before, and greatest while the head is passing, for then the cord is squeezed between the hard head and the pelvic bones.

2. *Premature attempts at breathing.* The cold air striking upon the body of the half-born child causes gasping, and the result is that mucus or liquor amnii is drawn into the air-passages, and suffocation occurs.

3. *Injuries during birth* caused by methods of extraction.

Diagnosis.

Abdominal Examination.—On inspection the upper part of the abdomen may be less broad than in vertex cases, but this is not always obvious.

On palpation—

At the fundus the hard, globular head can be felt, and it can be moved slightly from side to side independently of the body; also, under favourable conditions, a groove between head and neck may be made out.

(Try to get the head between the hands and to estimate its size and consistence, bearing in mind the fact that hydrocephalus is one cause of breech presentation.)

At the umbilical region the position, whether to right or left of the mother, and whether dorso-anterior or posterior, can be determined.

At the pelvis the hands will sink more readily into the brim than in vertex cases. The breech, being softer and smaller than the head, offers less resistance, and the absence of the head, with its hard, globular character, can be recognized.

The fœtal heart, if audible, will be heard at a higher level than in vertex cases, usually at or above the umbilicus on the side towards which the child's back lies.

On vaginal examination early in labour the presentation is high and hard to make out, and the membranes project into the vagina as a sausage-shaped bag.

Later, after rupture of the membranes, the buttocks, or one or both feet, or knees present.

If her examination of the abdomen has left her in doubt, the midwife must now decide whether it is the breech or the face which is presenting, and the points which guide her are:

1. That in the face she can feel the bony ridges above the eyes. (The examination must be gently made, or an eye may be injured.)

2. On putting a finger into the mouth the jaws and tongue can be felt, while if it has gone into the anus the finger will be soiled with meconium.

FIG. 32.—PASSAGE OF THE SHOULDERS IN PELVIC PRESENTATION; FIRST POSITION. (Galabin's 'Midwifery.')

FIG. 33.—PASSAGE OF THE SHOULDERS IN PELVIC PRESENTATION, ONE ARM EXTENDED; SECOND POSITION. (Galabin's 'Midwifery.')

3. The fold of the groin, if it can be reached, will leave no doubt as to its being a breech case, or an ear as to its being a face.

A foot must be distinguished from a hand as follows :

The presence of the thumb in the hand and its absence from the foot.

The presence of the heel in the foot and its absence from the hand.

The line of the finger-tips is V-shaped, that of the toes straight.

A knee is distinguished from an elbow by the presence of the knee-cap and the more substantial bones of the knee-joint. The elbow, on the other hand, is more pointed than is the knee.

Management of Uncomplicated Breech Delivery.

The midwife should ascertain the state of affairs, both as regards size of pelvis and position of child, early, and if unable to do so, she should send for medical aid while there is time.

Having assured herself that the case is not one of hydrocephalus or contracted pelvis (both of which require a doctor), her main endeavour should be to keep the membranes intact until the passages are fully dilated.

With this end in view, all unnecessary examination should be avoided, and straining efforts on the part of the mother forbidden. The woman should, when the pains become strong, be kept in bed, lying upon her

back. If the abdomen is pendulous, a tight binder should be applied. When the membranes rupture ascertain whether a limb or loop of the cord has been washed down by the gush of fluid, and if not, wait.

When the buttocks appear, if Nature is working well, simply support the parts as they are born, wrapping them up in a clean, warm cloth to prevent the child gasping.

If necessary, ease out the buttocks one by one with a *surgically clean* finger hooked into the fold of the groin.

Press upon the fundus.

Do not pull upon the parts born.

When the body is delivered as far as the umbilicus, draw down a loop of the cord to relieve tension upon it, and observe pulsation or its absence.

Feel with a finger for the arms, which should lie folded upon the breast, and should now slip out.

Again do not pull, but press upon the fundus. The shoulders having now come into the antero-posterior diameter at the outlet, ease them out, if necessary, one by one by a finger (surgically clean, as before).

Guide the body in such a way that the back of the child is kept towards the front of the mother, and thus ensure an occipito-anterior position of the head at the outlet.

As the head is entering the brim feel for the occiput with the hand which is upon the fundus, grasp the head, and press downwards and backwards to flex the neck, and thus ensure that the smallest available diameter of the head shall be thrown across the pelvis.

The head having come down in the occipito-anterior position, take the body of the child, wrapped in the cloth, in one hand, and, having seized it by the feet, sweep it forwards over the abdomen of the mother, at the same time putting the fore and middle fingers of your other hand over its shoulders, one on either side of the neck (see Fig. 34), to maintain flexion and to assist in levering out the head. If further leverage is required, hand over the body to someone else, or simply support it upon your arm, and put the forefinger of your free hand into the child's mouth, sufficiently far back to avoid dislocating the jaw, and press upon the back of the tongue, keeping up flexion all the time with the fingers over the shoulders, and by the combined action of the two hands draw the head at first downwards and then downwards and forwards, and thus extract it.

All this sounds long and perhaps difficult, but it can be more quickly done than said, provided that the midwife thoroughly understands beforehand what is required, and keeps calm at the time.

Difficulties and their Management.

Extension of the Legs.—The legs may be extended and lie near the shoulders; if this is so, there will be no advance, although the pelvis is normal, the parts are fully dilated, and the pains strong.

If possible, medical aid should be obtained as soon as obstruction is recognized, because it will be necessary to introduce a hand into the uterus and break up the

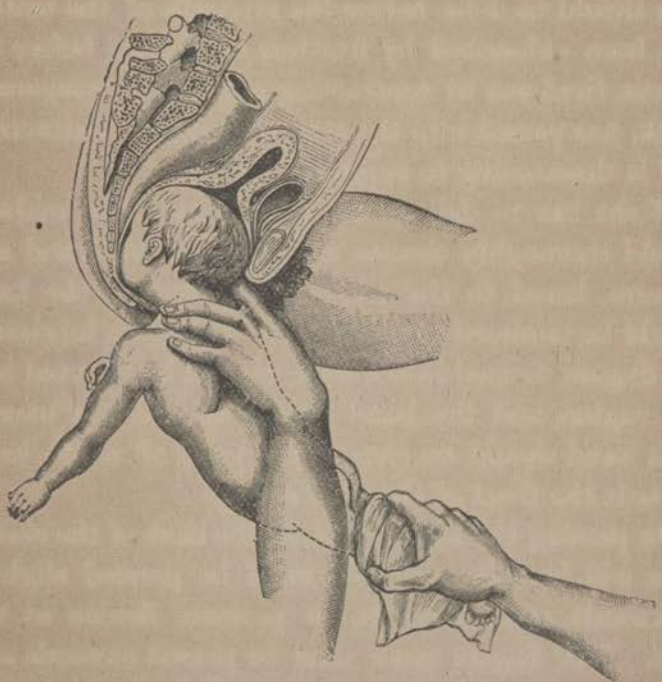

FIG. 34.—MANUAL EXTRACTION OF THE HEAD THROUGH THE OUTLET OF SOFT PARTS. (Galabin's 'Midwifery.')

wedge formed by the legs and body before delivery can be effected, and this can be done more easily, and with less shock and danger to the patient, if she is under an anæsthetic. If, however, there is no doctor available, the midwife may have to aid delivery, and this should be done before the strength of the mother has been exhausted by fruitless effort, and before the uterus, tired out by contracting against an insuperable block, has passed into the state of tetanic contraction, and is threatening to rupture.

If she has to deliver the case herself, the midwife should thoroughly cleanse and disinfect her hand and forearm, bared to the elbow. The *back* of the hand should be rendered slippery by an antiseptic lubricant; the fingers, formed into a cone, should be inserted into the vagina, and the hand passed up into the uterus. That hand should be chosen the palm of which looks towards the front of the child's body.

On passing the hand upwards the back of the child's knee will be felt, and this must be pressed slightly backwards and outwards, to promote flexion at the joint. The fingers must then be passed onwards and upwards until the ankle is reached. This must be taken between the fore and middle fingers, which are made to act as splints to the leg on either side, and drawn gently downwards over the front of the child's body, and thence out.

Should a pain come on during this manipulation the midwife must flatten her hand upon the child's abdomen, lest her knuckles bruise or go through the uterine musculature.

FIG. 35.—DESCENT OF THE HEAD. (Galabin's 'Midwifery.')

FIG. 36.—BREECH PRESENTATION WITH EXTENDED LEGS. (Galabin's 'Midwifery.')

One leg having been delivered, the other may come down, or the child may be delivered with it still extended; but if delivery does not proceed, the second leg must be treated similarly to the first. The legs having been extracted, delivery is completed in the usual way.

Extension of the Arms.—This usually results from pulling upon the body; but someone else may have done this, and the midwife, on her arrival, be required to undo the mischief.

The condition will be recognized by delay occurring after the birth of the umbilicus, in spite of strong pains and a normal pelvis, and on examination with the finger the arms will not be found upon the breast.

The principle of extraction is much the same as before: Disinfect the hand and arm, and having drawn down the child's body as far as possible, approach the arm from behind, find the elbow, flex it, and having splinted the arm on either side by your two fingers, bring it down across the child's face, and so out. If an arm has become lodged behind the neck, the child's body must be rotated in such a way that the face is made to look towards the misplaced arm; this will undo the twist which has caused the displacement, and enable the arm to be extracted in the usual way. During extraction one hand should be upon the fundus the whole time.

Extension of the head results from pulling upon the body, while the fundus is allowed to take care of itself. In a bad case, with a large head, it may necessitate the sacrifice of the child.

A lesser degree of extension is remedied by the

method given above—*i.e.*, a combination of pressure above the brim (whereby the forehead is made to travel along the curve of the sacrum), flexion of neck (by pressure of fingers over the shoulders), and jaw-traction with finger in the mouth.

In occipito-posterior positions of the head, if the latter is small and lying free in the vagina, it can be delivered by reversing the ordinary manipulation—*i.e.*, by sweeping the body backwards over the buttocks of the mother, flexing the head forwards, and rotating it out, with or without jaw-traction applied in front.

An even simpler method is to turn the body of the child over upon its front surface; the head turns with the body, and is delivered in the occipito-anterior position. This is quite an easy and safe method where the head is small and freely movable.

If the head fits tightly, and especially if the chin has caught against the top of the symphysis pubis, it will be necessary to pass up the hand into the hollow of the sacrum, and, taking the head between thumb and fingers, rotate it in such a way that the occiput is made to come to the front by the shortest route. Delivery is then completed as before.

Although in these cases there is no time to be lost, there is usually quite enough in which to do what is required, and here, as elsewhere, it is wiser to 'hasten slowly' and not to get into a panic. Five minutes is the utmost time to allow between the birth of the umbilicus and the delivery of the head if the child is to be born alive; sometimes three minutes' delay is

fatal, the difference depending upon whether or not pressure upon the cord is continuous.

In cases where, owing to failing pulsation in the cord or for any other reason, the midwife is warned of the necessity to hasten delivery, if she decides to do so by pulling upon the body, she must grasp the child by the bony pelvic girdle, and not by the abdomen. Her two thumbs should be placed parallel to each other upon the sacrum, and her fingers should encircle the pelvis; thus injury to the abdominal contents will be avoided. It is better, however, to call to one's aid greater force from behind by pressure upon the fundus, which stimulates the uterus to fresh effort, than to extract the child by force from in front, which is almost certain to cause extension of the arms, and perhaps also of the head, and thus increase the difficulty and delay.

Footling cases, being more dangerous than complete breech delivery, should, when possible, receive medical aid, as there is often some complication present, such as flattened pelvis; also, the fact that the presenting part does not completely fill the pelvic inlet is apt to result in prolapse of the cord, which slips down through the gap. When a foot is prolapsed, the midwife should, with a surgically clean hand, draw down the leg in such a way that the half-breech is made to fill up the os; this both prevents prolapse of the cord and stimulates the uterus to the more vigorous contraction which is required to complete dilatation. The leg should be wrapped in an aseptic dressing. In all these manipulations the utmost gentleness should be employed, otherwise serious injury may be caused.

If the midwife will go over the work carefully with the pelvis and manikin, and then perform the operations mentally a few times, she will be able thoroughly to master these details, and she will thus be in a position to save many lives; for though her rules clearly state that in all presentations other than the uncomplicated vertex or breech she must advise that medical aid be obtained, yet often everything depends upon prompt delivery, especially in those instances in which the midwife is not summoned until labour is well advanced; and although she has sent for aid, she should herself know what to do in these emergencies, and be able to do it, if need be, to save a life, before the arrival of the doctor.

CHAPTER XII

TRANSVERSE POSITIONS

If, instead of lying upright in the abdomen, the child takes up a crosswise position, the case is described as a transverse or oblique position, cross birth, or shoulder presentation. The more usual position is oblique, the head being lodged against one iliac bone and the breech lying upward under the mother's ribs at the opposite side.

The condition is one of gravest danger for both mother and child, for a fœtus of normal size cannot be delivered unless one pole comes first; therefore, unless the fœtus can be turned into an upright position, the uterus will be working against an insuperable resistance. Its upper part will go on contracting, and its lower part become stretched and thinned more and more, until it gives way under the strain, and rupture takes place, or the mother, worn out by the strain and anxiety of the fruitless labour, dies, undelivered, from exhaustion.

Generally, if transverse positions are seen early, it is possible, before rupture of the membranes, to set the position of the child right, and then to deliver it as in the normal case. This, however, becomes increasingly

FIG. 37.—DIAGRAM REPRESENTING THE FŒTUS AS FELT BY ABDOMINAL PALPATION IN SHOULDER PRESENTATION. (Jellett's 'Manual of Midwifery.')

The unshaded portions of the fœtus are those that are felt most distinctly.

difficult and dangerous as labour goes on, until at length there comes a time when it is impossible so to alter the position of the child that it can be born alive. It is thus of the utmost importance that the existence of the malposition should be recognized early.

Causes.—Any condition which gives rise to a deviation from the normal shape or position of the uterus, or which prevents the head settling into the brim, may be a cause of oblique position—*e.g.:*

A large, lax uterus lying in a pendulous abdomen, or a uterus which lies obliquely.
An overdistended uterus (as by hydramnios, or twins).
The presence of uterine tumours.
Flattened pelvis.
Placenta prævia.
Abnormalities in the shape or size of the child—*e.g.:*
A very large child.
A small, dead, immature, or premature child.
Tumours of child.
Twins.
Double monsters, etc

The commonest cause in primiparæ is an oblique uterus lying above a flattened pelvis, and in multiparæ a pendulous abdomen.

Mechanism.—1. If the child is alive and well flexed, and if the mother lies in a suitable position, provided that there is no pelvic flattening, the uterus will sometimes, by a strong effort, turn the fœtus into an upright position, and thrust the lower pole into the pelvic inlet. This is called spontaneous rectification

by head or breech, and only occurs when the uterus is vigorous, the pelvis sufficiently large, the membranes unruptured, and the child well flexed and of firm enough consistence to be turned round *en masse* in this fashion. This should never be expected or waited for after the escape of the liquor amnii, still less after an arm has prolapsed, for it will not occur.

2. When the child is very small, dead, and flaccid, and the uterus vigorous, the child may become more or less doubled upon itself, and expelled in that way.

This is described as—

(*a*) Spontaneous evolution when the shoulder is driven into the pelvis, the arm prolapses, the shoulder becomes fixed under the pubic arch, the back, acutely flexed, appears in the vulva, the breech follows, then the lower limbs, and lastly the head and remaining arm;

(*b*) Spontaneous expulsion when the head and chest descend together, following closely the prolapsed shoulder.

These methods of delivery should never be waited for, as they very rarely occur, the usual course of untreated cases being gradual exhaustion, and death of both mother and child.

Positions.—The child may lie in either of eight different ways, having just failed to present by vertex (either of the four vertex presentations) or by breech (again either of four positions); but the more usual arrangement is for it to be placed dorso-anteriorly, with its head in the mother's left iliac fossa, and its breech upwards, lying under her ribs on the right side —*i.e.*, it has just fallen short of being a first vertex case.

Diagnosis.—This should be made, if possible, entirely by abdominal examination, as to examine vaginally would risk rupturing the membranes before the position was rectified, an event to be avoided with the greatest care.

On inspection the abdomen often looks broader than in normal cases, or the swelling due to the uterus can be seen to lie obliquely (usually towards the right).

On palpation the parts of the child should be identified, and their position determined.

If the fœtal heart can be heard it will give some assistance in making out the position of chest or back (being best heard over these parts: chest, when child lies extended; back, when it is flexed).

If the abdominal examination has failed to reveal the position, and a vaginal examination is made, during the early stages the presenting part, lying as it does above the pelvic brim, will be so high that it is impossible to reach it, and should the os be dilated the membranes will be found protruding through it in a sausage shape. Later, after rupture of the membranes, a shoulder or arm usually comes down, sometimes accompanied by a loop of cord or a foot. Sometimes a part of the chest or back is to be felt high up, but can only be reached with difficulty.

It is of the greatest importance that the midwife should recognize with certainty the part which she feels, and to this end she should familiarize her fingers with every part of a baby's body outside the uterus, as, for example, when she is washing babies, in order that when examining internally, where she has no eye to

guide her, her fingers may give her a true impression of what they are touching.

A hand can be distinguished from a foot by the presence of the thumb; a knee from an elbow by the presence of the kneecap; and a shoulder from either by tracing it inwards and finding that it leads to the collar-bone or the shoulder-blade.

The cord is unlike anything else.

The ribs, too, are unmistakable, and the back is known by small bony masses—the spines of the vertebral column.

Treatment.—As soon as she finds out the state of affairs, or if she is unable to satisfy herself, the midwife is bound by her rules to advise that a doctor be sent for; and this is most urgently necessary. It should be done with the utmost promptitude if the case has been neglected, and if on her arrival the midwife finds an arm prolapsed.

Having sent for the doctor, the midwife should get the patient into bed, letting her lie upon the side opposite to that at which the fundus of the uterus lies; she should forbid all bearing-down efforts, and abstain from further examination, lest the membranes be ruptured or labour pains become so forcible that accidents occur before the arrival of the doctor; she should also get ready all things likely to be required, which will include plenty of hot and cold water, antiseptics for hands and douche, douche apparatus with newly boiled nozzle, catheter, also boiled, and a bath for the possibly asphyxiated child. The patient should not now be given any food, as, if internal version is

required, chloroform may be necessary, and food would be dangerous to the patient.

If no doctor is available, the midwife must, as her rules say, remain with the patient, and do her best for her. Here the best thing to do is to put the uterus upright—from outside, through the abdominal wall—before rupture of the membranes, to make one pole come over the pelvic inlet, push it well down, and put on a tight binder. A vaginal examination should then be made, and, if the presentation is vertex or breech, and the os is well dilated, the membranes may be ruptured, and labour allowed to proceed naturally. In order to straighten the position of the uterus, if the abdomen is pendulous, the overhanging portion should be lifted into good position after the woman has been placed upon her back, with the knees well flexed ; if it is oblique, she should lie upon the side opposite to the fundus, in order that it may fall over by its own weight, carrying with it whichever pole of the fœtus it contains, and causing the other pole to come over the pelvic inlet. The midwife can aid this by lifting the head, if this is at the lower pole, from the iliac fossa, and placing it centrally over the brim with one hand, and with the other lifting the fundus from under the opposite ribs into a central position above. The case is thus turned into an ordinary vertex presentation, and delivered without difficulty. Again, if the breech is lying in one iliac fossa, the same manœuvre would bring it over the pelvic inlet and convert the case into one of ordinary breech presentation, which would be delivered in the usual way. In those instances where

FIG. 38.—ARM PRESENTATION IN THE DORSO-ANTERIOR POSITION.
(Galabin's 'Midwifery.')

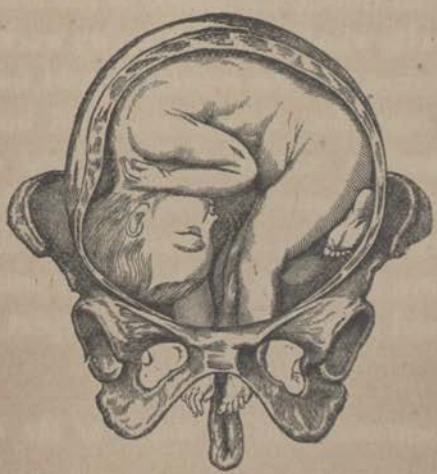

FIG. 39.—PRESENTATION OF A HAND AND FOOT WITH FUNIS.
(Galabin's 'Midwifery.')

the foot has prolapsed, this should be pulled down and the arm pushed up. This, with a little external manipulation, will cause the half-breech to present; but, in order to do it successfully, the midwife must know exactly how the child is lying; otherwise her efforts are likely to be misdirected, and therefore unsuccessful.

On no account should the midwife attempt to turn the child in the uterus after prolapse of the arm unless it is absolutely impossible to obtain medical aid. Even when done with the utmost skill, and under an anæsthetic, the operation of turning, when labour is far advanced, greatly increases the shock and danger of delivery; but if done unskilfully, when the woman is fully conscious and stiffening her muscles on account of the additional pain, it would almost certainly lead to rupture of the uterus and death of the mother.

The midwife who intends taking up work in outlying country districts or in the colonies should, however, learn to do this operation, for she may find herself face to face with such a case, far from medical aid, and the only person who knows anything about the condition. The best way to learn is to watch while the operation is being done, and then go home and practise it upon the pelvis and manikin until she is expert.

Presentation and Prolapse of the Cord.

The cord is said to present when it comes down before rupture of the membranes, and to prolapse when it escapes into the vagina after rupture, in advance

of the presenting part of the fœtus. Coming down so soon, the cord is subject to pressure more or less during the whole time occupied by delivery; the fœtal circulation in it is therefore stopped, and the fœtus born dead.

Treatment.—The aim should be to put up the cord into the uterus in the interval between pains. The woman should be placed with her pelvis at a higher level than her shoulders, in order that the cord may tend to fall back into the uterus by its own weight; the presenting part should be pushed up out of the pelvis, the cord replaced, and the presenting part pushed down again by pressure upon the fundus. If the membranes are still intact, they should then be ruptured (provided that dilatation is complete, or nearly so), and a tight binder applied to the abdomen.

If foot and cord present, the cord should, if possible, be replaced between pains, and the foot drawn down until the half-breech has descended, and is filling up the pelvic inlet.

CHAPTER XIII

ANOMALIES OF LABOUR

PRECIPITATE, or very rapid, labour is likely to occur when the child is very small in proportion to the passages; when the latter have undergone dilatation several times, as in multiparæ; or when the expulsive pains are unduly vigorous.

Dangers.—1. To the mother: It may cause no additional danger when due to the first two causes; in fact, the woman has a much easier time and seems to suffer no additional shock. On the other hand, when the expulsive pains are tumultuous and sufficient time is not allowed for gradual stretching of the soft parts, they are apt to be badly lacerated. Again, the child is sometimes born unexpectedly while the mother is standing up, and falls by its own weight, dragging the placenta and even the uterus after it, thus causing inversion (or turning inside out) of the uterus, with great additional shock and danger.

In other cases the uterus, exhausted by its unduly vigorous exertions, fails to contract and retract after the expulsion of the child, and post-partum hæmorrhage occurs.

In one case, reported some months ago, the membranes

ruptured a day or two before effective pains came on. The woman went about her work as usual. Then suddenly occurred one or two terrific pains; the child was born, and the woman found by her daughter in a condition of collapse. She died shortly after, and at the post-mortem examination the uterus was found to have ruptured.

2. To the child: The injury to the child usually results from being rapidly and unexpectedly born, and from falling, perhaps, upon a hard floor or into a pan of water. The cord sometimes breaks, but bleeding is not often serious, owing to the fact that the ends of the broken vessels curl up and stop the flow.

A child has been found in such circumstances suffocated by the bed-clothes or drowned by having lain with its face in a pool of liquor amnii.

Again, the child may be born with a caul—*i.e.*, the membranes have not ruptured—and if no one present has presence of mind to break the caul, the child dies of asphyxia.

Treatment.—Women who have had tumultuous labours in time past should be warned to go to bed at the first indication of labour pains, and to stay there until labour is over. They should not get up for any purpose, but should have all they need brought to them.

When pains are tumultuous, the patient should lie in bed *upon her side*, as in this position the weight of the child and the expulsive forces act at a disadvantage.

As the head distends the perinæum, the latter

should be carefully watched, and the head held back during the pains, and squeezed out in an interval in order to avoid laceration, the shoulders being treated similarly if necessary. During the whole of the expulsive stage the woman should be told not to hold her breath or bear down, but rather to cry out when pains come on.

In the event of premature rupture of the membranes, the woman should be warned to avoid strain, such as severe muscular work, and ordered to stay in bed; for, although in cases of too early escape of the liquor amnii labour is apt to be long and tedious, it may, as in the above-mentioned instance, be precipitate.

In cases of inversion of the uterus, the organ must be replaced—if necessary, under chloroform; the midwife should therefore send an urgent request for immediate medical aid.

If after expulsion of the child and its membranes, etc., the uterus fails to contract, the treatment for post-partum hæmorrhage should be carried out until the uterus has contracted and the bleeding stopped.

Protracted Labour is the opposite condition, and the cases may be divided into two classes, viz.:

1. Those in which the delay is due to an obstruction which renders it difficult or impossible for the child to be born.

2. Those in which no such obstruction exists.

The causes, symptoms, and treatment of these two classes are entirely different, and it is of the utmost importance that the midwife should not mistake the one for the other, or misapply the treatment.

OBSTRUCTED LABOUR may be due to—

1. Great disproportion between passenger and passages—*e.g.*, a very large child and a normal pelvis, or a child of normal size and a pelvis considerably smaller than the normal.

2. Deformities of the pelvis, of which the commonest is flattening or a combination of flattening and rickety deformity. Tumours of the pelvis or uterus.

3. Some unnatural position—*e.g.*, an oblique or transverse position, or impacted breech, mento-posterior face or occipito-posterior vertex.

4. Some anomaly of the fœtus—*e.g.*, hydrocephalus, fœtal tumours, double monsters, or locked twins. Often two or more of these causes exist together, as, for example, a flattened pelvis and a transverse position of the child or hydrocephalic fœtus.

Diagnosis.—The first thing which may strike the midwife who is called late to a case may be the fact that, despite vigorous pains, labour does not advance; and if she finds this to be the state of affairs, she should lose no time in sending for medical aid. If, however, she was called in good time, she should have been able to recognize, from her examination, the presence of most of the commoner causes of obstruction before labour was far advanced, and taken measures for their remedy—*e.g.*, the measurement of the intercristal, interspinous, and oblique conjugate diameters of the pelvis reveal pelvic deformity, if it exists. By abdominal examination she will be able to determine the position of the child, the size of its head, and whether or not that particular head can be made to

enter that particular pelvis. She will also have noticed the presence of any tumours or masses other than those which can be accounted for as parts of one or more children.

In breech presentation impaction may only become apparent after dilatation is complete, when, though the pains are strong, the presenting part does not advance; but there is usually ample time to rectify matters, provided the condition is recognized at the completion of the first stage of labour.

Effect upon the Mother.—For a time the presence of obstruction will incite the uterus to unusually great expulsive efforts, and the stronger the uterus, the more vigorous will be its attempts to overcome the obstruction; therefore the early expulsive pains may be expected to be strong and even tumultuous. Later, however, having been working against insuperable resistance, the uterine muscle becomes weaker and weaker, and the contraction feebler and feebler, becoming at the same time continuous (tetanic contraction). The liquor amnii drains away, the fundus and upper part of the body of the uterus retract and thicken, and the lower portion gets thinned and stretched over the part of the child which lies within it (this thinned portion can be felt as a line of depression through the abdominal wall above the pubes—the ring of Bandl), and rupture takes place. Undue protraction always increases the risk to the mother, but this continuous action of the uterus has a profoundly exhausting effect upon her nervous system. Her pulse-rate is increased to 120 or more per minute; she

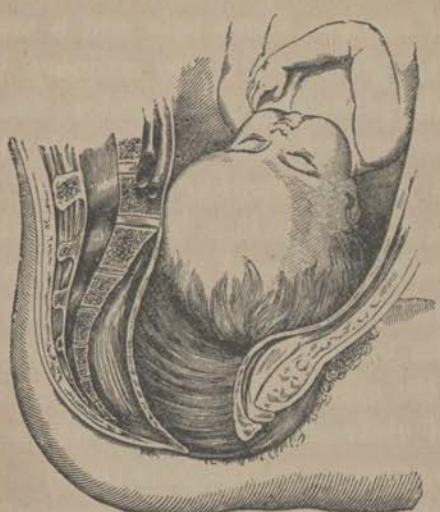

FIG. 40.—LABOUR IMPEDED BY HYDROCEPHALUS.
(Galabin's 'Midwifery.')

becomes distressed and restless; her face assumes an anxious expression; her temperature rises, and her respiratory rate is increased; her tongue becomes coated, dry, and black; nausea and vomiting ensue; the vagina becomes hot, dry, and swollen; and finally, if unrelieved, she sinks and dies from exhaustion.

In most cases of rupture of the uterus there is, at the time of rupture, sharp pain and a sense of something having given way; also ordinary labour pains cease, and the presenting part recedes; there is hæmorrhage, vomiting, and increase of shock; but in some instances a gradual wearing through of the uterine wall occurs, crushed as it is between the bones of the pelvis (usually the sacral promontory) and the presenting part, and in these cases the patient may simply sink and die without any of the symptoms proper to rupture of the uterus. There will, however, have been the signs of obstruction mentioned above if there has been anyone present to recognize them.

Treatment.—In badly neglected cases of obstruction the midwife can do nothing except send for medical aid, and prepare such things as will be required. For her to attempt to deliver such a case would almost certainly kill the patient, but she can do very much to prevent the occurrence of obstruction by the early recognition of abnormalities of pelvis, fœtus, or position, and the necessary skill is only to be acquired by oft-repeated examination of the abdomen and measurement of the pelvis. This requires a great deal of patience and perseverance, but if it only enables her to save *one* life, the midwife will be amply repaid for all

her trouble, and in the course of her life she may be able to save dozens of lives which would otherwise be lost.

NON-OBSTRUCTIVE DELAY may be due to a large variety of causes—some local, some general. Amongst the commoner are:

1. *Exhaustion* from any cause—*e.g.*, malnutrition, constitutional weakness, fatigue, loss of blood, oft-repeated child-bearing, immaturity, etc., of the expectant mother. These cases may be classed together as being due to *uterine inertia.*

2. *Increased Resistance.*—A condition of relative inertia may be coupled with some mechanical hindrance to expulsion—for example, a loaded rectum, full bladder, or overdistended uterus (as where hydramnios or twins are present), undue obliquity of the uterus, pendulous abdomen, etc. Adhesion of membranes around the os, spasm of the cervix—*i.e.*, a state of firm closure dependent upon nervous causes, likely to occur in elderly primiparæ who have suffered greatly at their monthly periods. Contraction of the tissues of cervix or os, due to the presence of scars, from old lacerations, or of new growths. Undue rigidity of soft parts which are being stretched for the first time, as in delicate primiparæ.

3. *Failure of the Auxiliary Forces.*—These may be ineffective, due to deficient muscular development, excess of fat in the abdominal wall, the presence of herniæ, etc., or to disease of heart and lungs, which makes it impossible for the patient to hold her breath during the pains and 'bear down.'

Undue sensitiveness to pain and deficiency in self-control act similarly.

Several of these causes may co-operate in rendering labour tedious.

Uterine inertia is said to be *primary* when from the beginning of labour the pains have been weak and ineffective; *secondary* when, after beginning well, the strength and vigour of the pains go off, and they become weak.

Delay from non-obstructive causes, and so long as the membranes are intact, is during the first stage not attended by much danger to mother or child. The mother may become fatigued, but the child, being protected by its enveloping water-cushion, receives no injury. After rupture of the membranes the danger to both is increased. The mother's fatigue may amount to exhaustion, and the child may be subjected to dangerous pressure. The midwife, therefore, provided she knows that no obstruction exists, need not seek medical aid in the early part of labour, but should do so in good time after rupture of the membranes, when it is obvious that the patient's strength is insufficient to complete the expulsion of the child. A primipara should not be allowed to remain in the second stage longer than about four hours, nor a multipara longer than two hours, without receiving aid.

Diagnosis between Obstructive and Non-Obstructive Delay.

1. *Pulse, Temperature, and Respiration.*—In obstruction the pulse is at first full, strong, and of normal

rate; it becomes more and more rapid as the case advances, and as exhaustion comes on its rate increases to 120 or more beats per minute, and it becomes weak and almost imperceptible at the wrist. The temperature rises 1 or 2 degrees, and the rate of breathing is increased.

In non-obstructive cases the pulse-rate remains unaltered, or only slightly increased (under 100 per minute), and the temperature and respiration-rate are normal.

2. *Expression and Aspect of Patient.*—In obstruction the patient looks distressed, pinched, and extremely anxious.

In non-obstruction she looks placid, though fatigued.

3. *On Abdominal Examination.*—In obstruction the uterus becomes tender, hard, and irregular in shape, having contracted firmly about the fœtus, and when rupture is threatening, Bandl's ring can be felt as a transverse furrow lying just above the pubes.

In non-obstructive cases the abdomen remains soft, the uterus hardens very little under the pains, and there is no tenderness.

4. *On Vaginal Examination.*—In obstruction the vulva and vagina are hot, dry, swollen, and tender. If the presenting part has entered the pelvis, it becomes immovably fixed. There is a large caput succedaneum, and in head presentations the sutures cannot be felt.

In non-obstructive cases the vagina is normal as regards temperature, there is no swelling, the presenting part is freely movable, and there is no large caput.

The signs and symptoms of the two conditions being so widely different, there should be no danger of the one being mistaken for the other. Such a mistake would, if made, be very disastrous for the patient, as the treatment to be carried out in the one case is exactly opposite to that for the other.

Treatment of Some of the Causes of Delay.

Time and patience will overcome the difficulty in many cases. During the first stage of labour, if the pains are weak and the patient is tired, she should be put to bed and allowed to sleep for an hour or two, after which the pains will come on again with renewed vigour, and labour will be completed without assistance.

Hot fluids—*e.g.*, Lemco and milk—given when she wakes will help matters.

A hot bath, continued for half an hour or longer, will often overcome spasm of the cervix, and allow dilatation to proceed.

A full bladder or rectum must be emptied.

If the membranes are adherent around the os, a disinfected finger should be inserted through the cervix and swept around in circular fashion to detach them.

In cases of overdistension of the uterus, as soon as the parts are fairly well dilated the membranes should be ruptured.

In obliquity of the uterus or pendulous abdomen the parts should be put into good position by external manipulation and a tight abdominal binder applied. Sulphate of quinine (in 10-grain doses), given by the

mouth, with milk, and repeated twice at intervals of twenty minutes, will often quicken and strengthen weak pains.

In many cases nothing but help from outside—*i.e.*, by the forceps—will effect delivery, and for these medical aid must be sought.

Anomalies of Cord, Placenta, and Membranes.

1. The *cord* may be too short, in which case it is apt to be a cause of malpresentation and delay in birth, and sometimes of premature separation of the placenta.

2. The cord may be too long, when it tends to become wound about the neck, body, or limbs of the fœtus, and may seriously hinder birth. In this way a cord which is really too long is converted into one which is virtually too short.

3. Knots may form upon the cord, which, if tightly drawn, stop the circulation in its vessels, and cause fœtal death. False knots sometimes occur which are simply local thickenings, due to heaping up of Wharton's jelly, and are of no importance.

The Placenta. — 1. *Battledore* placenta is very common, and of no importance. The term explains itself: the cord forms the handle of the battledore, being inserted near the margin of the placenta.

2. A *velamentous* insertion of the vessels is a condition in which the vessels of the cord, instead of being bound together into a single rope all the way down, branch before reaching the placenta, and are inserted separately into it. The danger here is that one or

more branches may be torn before or during birth, and hæmorrhage occur.

3. A placenta is said to be *succenturiate* when, in addition to the usual plate-like mass forming the great bulk of the placenta, one or more islands of placental tissue are scattered about the chorion. The condition results from the persistence of patches of primitive chorionic villi, which should have disappeared quite early in pregnancy. The presence of such seriously adds to the mother's risks, for during expulsion of the membranes the chorion is apt to break away from the scattered islands, and leave them in the uterus, where, if they are overlooked, they cause pain, recurrent hæmorrhage, and finally sepsis. The way to avoid this train of evils is to thoroughly examine every placenta and bag of membranes. Each placental island is supplied with bloodvessels, and when one is left in the uterus the torn ends of the vessels leading to it can always be found if they are looked for. The condition is rare, but its consequences are apt to be very serious; it should therefore always be borne in mind, and when gaps in the chorion are seen, the broken vessels should be carefully sought.

4. A *membranaceous* placenta is one in which the placental tissue forms scattered tufts more or less all over the chorion. It is apt to be adherent and very difficult of complete removal. Fortunately, the condition is exceedingly rare.

5. A *placenta prævia* is one which is attached to the lower uterine segment. It is fully described under Ante-partum Hæmorrhage.

6. Adherent placenta is usually due to pre-existing uterine inflammation. Its removal necessitates medical aid.

7. Fatty or chalky deposits are sometimes found in the placenta, or cysts upon its fœtal surface. They are of no importance from the point of view of the midwife.

The Membranes.—These may be—

1. Too thin, in which case they are apt to rupture prematurely; the liquor amnii then drains away before dilatation is complete, and dry labour ensues. Labour is usually tedious, and may be dangerous for mother and child.

2. Too thick, and liable to persist until after birth. The child is then said to be born with a caul. The treatment is to rupture the membranes promptly, and peel them off the face; otherwise the child, being unable to breathe, will die from asphyxia.

CHAPTER XIV

HÆMORRHAGE

THE symptoms and signs of severe hæmorrhage are as follows :

The patient is pale, skin, gums, and lining membrane of eyelids being blanched.

She is restless, throws her arms about, and struggles for breath.

She often complains of a feeling of nausea and faintness, and says that she feels as if she were sinking through the bed.

Her sight fails ; she says that everything is becoming dark ; and she hears a sound as of singing or rushing water in her ears.

Her pulse is feeble—sometimes so rapid as to be uncountable, sometimes so small that it cannot be felt.

The surface of the body is cold and the skin often covered with cold perspiration ; mental wandering or loss of consciousness is present in some cases.

The severity of these signs and symptoms varies according to the amount of blood lost.

Sometimes there is no external bleeding, the blood having been poured into some cavity of the body

from which it cannot escape, as, for example, into the peritoneal cavity, in rupture of the sac of an extra-uterine pregnancy, or into the uterus before dilatation of the neck, as in concealed accidental hæmorrhage.

If, therefore, the above signs and symptoms are present, or several of them, although no blood is to be seen, the case is one of serious bleeding, and a doctor must be sent for.

Bleeding coming on in a pregnant woman before delivery is termed ante-partum, and after delivery post-partum, hæmorrhage.

Ante-partum Hæmorrhage.

Ante-partum hæmorrhage will be considered under the following headings:

1. Menstruation.
2. Abortion.
3. Extra-uterine pregnancy.
4. Moles.
5. Accidental hæmorrhage.
6. Placenta prævia.
7. Miscellaneous causes.

1. MENSTRUATION.—This usually ceases as soon as conception has taken place; but, since the mucous membrane covering the ovum does not come into contact with that lining the general uterine cavity until about the end of the third month of pregnancy, it is possible

for the flow to occur three times. It rarely occurs at all, and still more rarely more than once, any bleeding at early monthly periods being much more likely to be caused by threatened abortion. A monthly discharge going on during the whole term of pregnancy has been described, but it in all probability does not represent true menstruation. The best treatment is to send the woman to bed until the flow has ceased.

2. ABORTION.—This term usually means the birth of a fœtus within the first three months of pregnancy, but may mean labour coming on at any time before the fœtus has reached that stage of development at which it is capable of separate existence. The midwife *must not* undertake the responsibility of treating abortion or miscarriage, but must in all cases send for a doctor.

Causes of Abortion.—Anything resulting in death of the fœtus or its separation from the wall of the uterus will act as a cause. Among the commoner causes are the following :

Syphilis in either parent.

Drunkenness in either parent, especially in the mother.

Certain forms of *poisoning*, especially lead and mercury poisoning amongst women who work with these metals, as in pottery, paint-making, the manufacture of white or red lead, thermometer or mirror making, and even sometimes after an extensive spring cleaning, with painting of the walls, etc.

(Pregnant women should not sleep in newly painted rooms until the smell of paint has gone off.)

Under this heading come also many drugs and other preparations taken by women to cause abortion. These usually fail in their object, and instead cause illness in the mother and feebleness in the infant at and after birth.

Fevers.

Constitutional diseases.

Local conditions in the uterus—*e.g.*, subinvolution, or chronic inflammation from any cause, or malposition, especially retroflexion of the uterus.

Habit. Sometimes a woman forms a habit of aborting, no recognizable cause being present.

Accidents—shock or injury.

Criminal abortion. To do or attempt, or to induce anyone else to do or attempt, anything intended to bring about an abortion is a criminal offence, both morally and legally, and brings its own punishment. The woman who destroys the life of one of her children is less fit to be a good mother to the others, apart from the injury caused to her own health; also, the law of the land regards the offence as a serious one, and punishes it accordingly, both the person who does the work and she who suffers it to be done being regarded as equally guilty.

Varieties.—An abortion may be *threatened* or *inevitable*, and in the latter case the ovum may come away entire, when the case is termed one of *complete* abortion; or some part of it may be retained in the uterus, in which case the abortion is said to be *incomplete.*

As mentioned elsewhere, abortion is most likely

to occur at what would have been the monthly periods, and it is at these times that special care is necessary, particularly in the case of women who are suffering from any of the conditions mentioned as causes of abortion.

Symptoms.—Loss of blood and pains like those of labour are the two symptoms which tell us that abortion is threatening, and if in addition there is dilatation of the os or escape of clear fluid, or if some part of the ovum is presenting, the abortion is inevitable.

Treatment.—Send for a doctor, and while waiting get the patient to bed and keep her *absolutely* quiet. She should not be allowed to get up for *any purpose,* nor should friends be admitted or letters or papers brought to her; also, the house should be kept quiet. It may be that the pain and hæmorrhage will cease under this treatment, combined with a sedative draught, which the doctor may see fit to prescribe. If bleeding is slight, it will suffice to put on clean pads or diapers; if more severe, it may be necessary to do something to stop it, although it usually lessens when the woman is put to rest.

Here the midwife's choice lies between giving a vaginal douche at 115° F. (cyllin and water, 1 drachm to the quart) and plugging the vagina.

It is best to avoid plugging where possible, for the midwife is not equipped with the necessary appliances for doing it thoroughly and antiseptically, and when done inefficiently it is worse than useless; the midwife should, therefore, only attempt it in a desperate case

where a doctor cannot be obtained. If it is decided to plug, some newly boiled linen or cotton-wool should be used. If linen, it should be torn into long strips. One knot should be tied at the end of the first, two at that of the second, and so on, in order that when they are removed none may be left behind. If wool, the pledgets should be tied upon a length of narrow tape, and the whole boiled together. When plugging, two fingers are laid upon the back wall of the vagina to keep the passage open, and the other hand packs the material of the plug firmly around the neck of the uterus to the level of the os, and then fills the remainder of the vagina as full as possible; a folded diaper is then placed over the vulva to keep the plug in position, and pinned firmly to a binder applied tightly around the abdomen. The uterus is thus compressed between plug inside and binder outside, and the bleeding ceases; also the pressure causes the uterus to contract and expel its contents. In cases of incomplete abortion—and, indeed, in all cases where clot or anything else comes from the uterus—all must be saved and shown to the doctor; it is only by seeing what has been passed that he or she will be able to judge without exploring whether or not anything has been left behind. To explore the uterus amid dirty surroundings involves additional risk to the patient from septic infection, which she can be spared if the doctor can see that what has been passed represents the whole of the ovum.

With regard to feeding, the patient should only have small quantities of slightly warm milk, or some other

non-stimulating fluid, until medical aid arrives; and in those instances in which part only of the ovum has been passed no food should be given, in case the doctor should decide to give chloroform and clear out the uterus, in which event food would be likely to cause dangerous vomiting when the anæsthetic is administered. Sometimes the midwife is not summoned until the abortion is over, and the woman perhaps suffering from high temperature and foul discharge. Whether or not this is the case, the midwife should obey the rule, and decline to be responsible for the nursing unless a doctor is called in.

The after-treatment of abortion should receive at least as much care as that of full-term pregnancy, and the woman be kept in bed for the usual period.

3. EXTRA-UTERINE PREGNANCY. — The ovum is usually fertilized in the Fallopian tube, and, having afterwards been swept onward into the cavity of the uterus, settles down there and proceeds to develop. Occasionally, however, its progress is arrested before it arrives at the uterus, and it begins to undergo development in some wrong situation. The commonest place for this to occur is in the Fallopian tube, and the latter, not being suitably constituted to bear the strain of the presence of the growing ovum within it, gives way and bursts; neighbouring vessels bleed, and the woman is in the greatest danger.

The *symptoms* of extra-uterine pregnancy are very similar to those of ordinary pregnancy, but there is usually, in addition, pain upon one side of the lower abdomen (the side on which the ovum lies), and often

there are slight and irregular losses of dark blood from the vagina.

The bursting of the tube may occur suddenly, generally about the second or third month. The patient rapidly becomes extremely ill, and complains of great pain. She generally retains consciousness and presents all the signs and symptoms of severe hæmorrhage, but no blood escapes, or only a little.

The *treatment* is to get a doctor as quickly as possible, and meanwhile to keep the patient *absolutely* still and quiet. If she is lying on the floor, let her lie there, and by no means move her, as the slightest movement increases the hæmorrhage which is occurring internally, and may be just enough to kill her.

4. MOLES.—The term 'mole' simply means a mass. It is used in midwifery to denote an ovum which has perished and is retained. Moles are of two kinds:

(*a*) *The Fleshy or Blood Mole—i.e.*, an ovum into which sufficient bleeding has occurred to cause the death of the fœtus. The presence of such a substance in the uterus is usually followed by uterine contraction, which expels the ovum, an ordinary abortion taking place. Sometimes, however, the dead ovum is retained, it becomes firm and hard, and later on is expelled as a dense mass, or it may decompose before expulsion, causing the health of the patient to fail, and giving rise to a bad-smelling brownish discharge.

The symptoms are those of early pregnancy up to the time of the death of the fœtus, after which the symptoms of pregnancy subside, the breasts quiet down, and the abdomen ceases to enlarge.

Treatment.—If the patient has a foul discharge and is becoming ill, a doctor should be consulted.

(*b*) *The Vesicular Mole.*—In this condition the chorion (or outer fœtal membrane) is diseased and takes on an unduly active growth, increasing at the expense of the fœtus, which usually perishes early. The early signs are those of pregnancy, followed soon by a too rapid increase in size of the abdomen for the term of pregnancy reached. On examination no fœtal parts can be felt nor fœtal heart heard. There is usually also an irregular blood-stained discharge from the vagina, in which fragments of the growth may be found, looking something like white currants floating in pink juice. Medical advice should always be obtained.

The condition is a serious one for the mother, for, although in many cases the mole either comes away or can be removed completely, it is sometimes followed by a rapid form of new growth in the uterus, which causes death within a short time.

5. ACCIDENTAL HÆMORRHAGE.—This is bleeding occurring before delivery, due to the too early separation of a normally situated placenta—*i.e.*, one placed at some distance above the internal os.

Varieties—(*a*) *Evident.*—The blood poured out escapes from the vulva, and one can see at a glance the amount lost.

(*b*) *Concealed.*—Bleeding occurs into the uterine cavity, but none escapes externally. This is more dangerous, for though the woman is obviously ill, the cause of the illness often remains unknown, and there-

fore the condition is untreated until she has lost more blood than she can spare. Sometimes the placenta becomes detached in its central part, and blood is poured out between the placenta and the uterine wall, the amount being limited by the margins of the placenta which remain attached. This is the less serious variety of concealed accidental hæmorrhage, and is known as retroplacental bleeding. The blood clots, bleeding stops, and unless the area of separation is very large, little harm results. If it is large, the child is more or less cut off from its blood-supply by the separation of the placenta, and is born in asphyxia. After the birth of the child, the firm dark-coloured clot is cast out from the uterus (retroplacental clot).

The much more serious form of concealed accidental hæmorrhage is that in which more or less of the placenta, *including the margins*, becomes detached. Here there is nothing to limit the bleeding, unless some pressure can be brought to bear upon the uterine vessels, and blood is poured out between the uterine wall and the ovum, until the uterus is enormously distended.

(*c*) *Mixed.*—Part of the blood escapes externally, and part is retained in the uterus.

Concealed accidental hæmorrhage is happily rare, and only likely to occur in a very unhealthy uterus; for if the uterine muscle were healthy, the fact that it is being suddenly stretched by the blood poured into it would set up contraction, which would limit the bleeding.

Signs and Symptoms.—The general signs and

symptoms of hæmorrhage given above will be present in proportion to the amount of blood lost. In the case of evident hæmorrhage there will also be the external bleeding. In the concealed form there will be no external loss, but the uterus will become distended, the abdomen tense, painful, and very hard, and the patient more and more collapsed.

The picture of concealed accidental hæmorrhage is sufficiently striking. The patient is evidently very ill: her skin has a peculiar yellowish or earthy colour; she says she feels sick, and complains of great pain in the abdomen; also, the latter, when touched, feels 'as hard as a board.' Nevertheless, the condition has, with disastrous results, been mistaken for a bilious attack. When the hæmorrhage is partly evident and partly concealed, there will be more collapse than can be accounted for by the amount of visible bleeding.

Treatment.—Send for the doctor and put the patient to bed; put on a tight binder, and if the bleeding lessens, wait for the doctor, and get ready the things which will be required—viz., a newly boiled catheter, apparatus for douching, and a supply of hot and cold water. If severe bleeding continues, the woman's life is in peril, and something must be done to save it. The surest way of stopping the bleeding is to empty the uterus and cause it to contract, but this can only be done by the midwife when the neck of the uterus has opened. If, therefore, on vaginal examination it is found that dilatation is complete, or nearly so, she should rupture the membranes and deliver, giving a

hot vaginal douche immediately afterwards to stimulate uterine contraction, and one or more doses of liquid extract of ergot at intervals of twenty minutes to maintain it.

If, on the other hand, the neck of the womb is only slightly or not at all open, she cannot do this (it is always a very great mistake to rupture the membranes too soon, even if they can be reached), and her object now must be to bring some pressure to bear upon the bleeding vessels. A vaginal plug, properly applied, is the best means of bringing this about, as it not only stops bleeding, but also excites uterine contraction.

A catheter should be passed and a hot vaginal douche given before plugging, which should then be done as described above. In those cases where the neck of the uterus is partly opened this also should be plugged.

6. Placenta Prævia.—A placenta prævia is one which is attached to the lower part of the uterine wall, and which, therefore, must become detached during the opening up of the internal os. As the placenta separates the vessels at its site of attachment bleed, and inasmuch as this bleeding cannot be prevented, it is called unavoidable hæmorrhage.

History, Signs, and Symptoms.—There is often a history of previous uterine trouble, as in a healthy uterus the placenta does not as a rule become implanted low down. Bleeding, more or less severe, may occur several times during the later months of pregnancy, and labour is apt to come on prematurely; also malpositions are common, because the abnormally

situated placenta fills up the pelvic inlet and prevents the entry of the presenting part. On the other hand, such a history is often absent, and an alarming flooding is the first signal that anything is amiss.

Diagnosis.—The position of the child should be ascertained by abdominal examination, according to the rules given above, and on vaginal examination the placenta may be felt as a boggy mass, which can hardly be mistaken for anything else. If the os is undilated, it can still be felt through the neck of the uterus and roof of the vagina.

Treatment.—The same rules apply here as elsewhere —viz., send for a doctor and try to stop the bleeding until aid can arrive.

If the hæmorrhage be slight, absolute rest in bed may effect this for a short time, but the peril to the mother's life continues until the uterus is empty and contracted. If bleeding is severe and help at hand, the midwife may be able to moderate the flow of blood by holding some form of temporary plug (for example, a piece of newly boiled lint wrung out of cyllin lotion) over the os, and firmly pressing upon the bleeding site. The hand should be disinfected, the plug inserted into the vagina, and then the whole hand introduced, the elbow supported upon the bed, and steady upward pressure made, the uterus being at the same time pushed downward from outside by the other hand, or, better, by another person. This is only a very temporary measure, for it is impossible to keep up effective pressure in this way for more than about twenty minutes.

If there is no possibility of speedy medical aid, and

FIG. 41.—PLACENTA PRÆVIA. (Galabin's 'Midwifery.')

Two varieties of insertion are indicated: one in which the placenta overlaps considerably the internal os, and would appear as a complete placenta prævia when the os was partially dilated; one in which it is attached just short of the internal os, and would appear as partial placenta prævia when the os was partially dilated.

the os is closed or nearly so, plugging the vagina is the best treatment (see p. 194).

If the os is almost fully dilated, the hand should be introduced into the vagina and a finger swept around inside the os, in the hope of detaching part of the placental margin, and reaching the bag of membranes, which should then be ruptured. If the head is felt coming down, pressure upon the fundus may now cause speedy delivery. If, on the other hand, the midwife feels a foot as she ruptures the membranes, she should draw it downward and bring the half-breech into the os. This will act as a plug and stop the bleeding, and will also stimulate uterine contraction. A strip of clean material should be tied round the ankle and pulled upon if bleeding begins afresh; otherwise the case should be left to Nature, which will soon finish delivery.

After ante-partum hæmorrhage there is always increased risk that post-partum hæmorrhage will occur. The midwife should therefore watch the patient very carefully after delivery is complete for any signs of the onset of bleeding, and should be prepared to treat promptly any which may take place.

If a large amount of blood has been lost, it will be necessary to supply additional fluid to the circulation, as described under Post-partum Hæmorrhage, by giving saline enemata.

Hot-water bottles wrapped in flannel are also likely to be necessary to keep the feet and legs warm.

The nursing of the case must be carried out with even more than usual care as regards cleanliness, since

the patient's power of resistance has been diminished by the loss of blood, and she is therefore more liable to fall a victim to sepsis.

7. MISCELLANEOUS CAUSES:

Tumours of the uterus.

Cancer of the neck of the uterus.

Lacerations or rupture.

Rupture of varicose veins of the vulva.

All these conditions require medical aid, and when they exist the midwife should decline the responsibility of the case unless a doctor is in attendance. If called suddenly to a case of ruptured varicose vein of the vulva, she should keep up pressure (with a clean pad of wool wrung out of antiseptic lotion) upon the bleeding-point until the doctor arrives.

Post-partum Hæmorrhage.

This is bleeding occurring after delivery. If it takes place just after delivery, it is called primary post-partum hæmorrhage; if after the lapse of several hours, secondary. Of the two varieties, the second is the more serious—partly because the woman has less strength to bear it, and partly also because she is likely to be alone at the time of its occurrence, and therefore without skilled aid.

Post-partum hæmorrhage, both primary and secondary, is usually preventable, and here, as always, prevention is better than cure.

Nature's Method of Prevention.—As mentioned above, the great bulk of the uterine wall is made up of

muscle, the strands of which pass in varying directions, forming a complex interlacement. Between these strands run the bloodvessels, and when the muscle contracts a compressing force is brought to bear upon each vessel from several directions at the same time, which makes it impossible for blood to flow along it; also, a gummy material is deposited from the blood which has passed along upon the interior of the vessel walls, which, when they are compressed, glues them together, and prevents further hæmorrhage. In post-partum bleeding the blood usually comes from the placental site. This is an area of spongy tissue, in the meshes of which are large blood spaces and vessels, which, were it not for some compressing and gluing mechanism, would, on the separation of the placenta, bleed freely. That profuse hæmorrhage does not occur in every case is due to the fact that before, during, and after separation of the placenta, the uterus contracts, closing up the vessels as they are laid open by the tearing off of the after-birth.

CAUSES—1. *Adherent or Retained Placenta or Membranes.*—After a part of the placenta has become detached, the vessels at the site of separation tend to bleed, and so long as any portion remains adherent to the uterine wall or is retained in the uterus, the latter cannot completely contract; hence hæmorrhage occurs. A very small portion of adherent placenta is enough to cause repeated losses of blood, which weaken the patient, hinder her recovery, and predispose her to sepsis.

Adherent placenta may be the result of previous

inflammation of the interior of the uterus; but incomplete separation, with retention of small portions of placenta, is more frequently caused by misdirected efforts to shorten the third stage of labour, and to induce the tired uterus to expel the placenta and membranes before it has recovered from the fatigue caused by the expulsion of the child.

Mismanagement of the third stage is therefore often the cause of this form of post-partum hæmorrhage. In nearly every case, provided that the uterus is healthy, and is allowed to take its own time about recovery, it will soon begin to contract and expel the placenta entire. On the other hand, if unreasonably stirred up while still in a state of exhaustion, it too will behave unreasonably, and either refuse to contract altogether, bleeding freely instead, or else contract partially, and imprison parts of its contents. In these circumstances, to pull upon the cord makes matters worse, and may result in the tearing off of parts of placenta which are not ready to separate, inversion of the uterus (the whole organ turning inside out, the placenta remaining attached), or (if the placenta has become detached) in the sudden emptying of a relaxed uterus, which is sure to be followed by a great gush of blood from the open mouths of the vessels.

The attitude of the midwife during the third stage should be one of watchful expectancy. She should guard the uterus, as it lies in the hollow of her hand, and know exactly what it is doing; but, unless Nature is failing to do its work, she should not initiate any new move, but rather follow Nature's lead,

and not try to express the placenta until she knows, by the signs given above, that it is ready for expression.

2. *Exhaustion.*—This may be due to many causes—

(*a*) Previous losses of blood—*i.e.*, ante- or post-partum hæmorrhage.

(*b*) Prolonged, difficult, or instrumental labour.

(*c*) Overdistension of the uterus, as by hydramnios or twins.

(*d*) General exhaustion, due to consumption, heart, lung, or kidney disease, drunkenness, overwork, or semi-starvation.

(*e*) Anæmia due to any cause. The impoverished blood not only fails to clot well and seal up the mouths of the uterine vessels, but the uterus itself, having been supplied for some time with poor blood, is ill-nourished and wanting in contractile power.

(*f*) Local exhaustion, caused by some unhealthy condition in the uterus itself.

Due to some of these causes, severe hæmorrhage may occur, despite the most careful treatment; but the important point is for the midwife to be quick to notice any departure from health in her patients, and not to undertake responsibility for cases of labour complicated by general disease; she must also be prompt in recognizing abnormalities in pelvis, position, etc., in order that abnormal cases may be suitably treated before exhaustion sets in. Again, after the patient has bled or gone through a specially trying time, greater care than usual is needed in the management of the remainder of labour or of the puerperium, as the

case may be—longer rest in bed and stricter guarding against sudden movement, excitement, etc., which would cause recurrence of the bleeding.

Happily, severe post-partum hæmorrhage does not occur very frequently amongst the poor; but when it does happen, someone with skill to recognize the warning signs and to treat secondary hæmorrhage should in every case stay with the patient during the first night, or until her pulse has been normal and the contraction of the uterus and her general condition satisfactory for some hours.

3. *Miscellaneous Causes.—A full bladder or rectum* will hinder uterine contraction by mechanically pulling or pushing the uterus up out of the pelvis. If, then, the uterus being relaxed, the patient makes some sudden movement or becomes excited, her heart beats more quickly and forcibly, and the sudden increase of blood-pressure in the uterine vessels causes them to become unsealed by displacement of the blood-clot which had formed within them, with the result that secondary flooding occurs. If the amount of bleeding is not excessive, none may escape externally, but, instead, become clotted inside the uterus, and converted into a firm, hard mass, which still further hinders uterine contraction.

Tumours in or about the uterus act mechanically in the same way.

Excitement, worry, or *alcohol-drinking.*

Overexertion, before the uterus has had time to involute.

Most of these agents act by causing an increase of

blood-pressure, which displaces clots forming in the bloodvessels, and converts them into open tubes, from which blood can freely flow.

The extraction of a child or placenta when the uterus is in a relaxed condition causes hæmorrhage by the sudden removal of a body which was keeping up a certain amount of pressure upon the placental site. This sudden emptying of the uterus is sometimes undertaken for a special reason, but before doing it arrangements should always be made for stopping the hæmorrhage which is very likely to follow.

PREVENTION. — The right management of labour will in the majority of cases prevent post-partum flooding.

During the First Stage useless waste of energy must be prevented and the strength kept up ; abnormalities should be diagnosed, in order that aid may be secured in time ; too early rupture of the membranes should be avoided, and, after rupture, the patient should be kept in bed.

During the Second Stage.—If assistance is required, it should be given in time ; the strength should be maintained, and sudden emptying of a relaxed uterus avoided.

During the Third Stage hurry should be avoided, the uterus carefully guarded, and the placenta properly managed.

After expulsion of the placenta, uterine contraction should be secured and maintained.

In case of flabbiness of the uterus something should be given to stir up uterine contraction. For this few

things are better than a wineglassful of vinegar taken by the mouth ; it acts more quickly and certainly than the liquid extract of ergot usually given. The natural means of stirring up uterine contraction is a reflex stimulus caused by suckling the child. Unless, therefore, the mother or child is very feeble, the latter should be put to the breast. In the case of elderly women who have borne many children it is a good routine practice to give a drachm of the liquid extract of ergot (or, better still, of the ammoniated tincture) as soon as it is ascertained that the uterus is empty, as in them the uterine muscle does not so readily recover its tone as in stronger and more vigorous patients. The drug should be bought in small quantities from a chemist who has ready sale, and therefore frequent fresh supplies, as it soon loses its efficacy on keeping.

TREATMENT.—In all cases of hæmorrhage a doctor must be sent for, but where flooding is severe the midwife must herself be prepared to stop it before the arrival of the doctor if she is to save her patient's life.

If the placenta is still in the uterus, it must be removed — by expression, if possible, as this method involves less risk to the patient than any other.

To express the placenta the left hand should be placed upon the abdomen in such a way that its inner border is made to sink deeply behind the fundus of the uterus and the latter made to lie in the hollow of the palm. This hand, aided, if necessary, by the right

hand placed in front of the uterus, should make steady pressure in a downward and backward direction, and if the placenta is detached from the uterine wall, it will readily be expressed.

If this fails, the placenta must be removed by a hand inserted into the uterus. To do this the right hand should be disinfected, made into the shape of a cone, and introduced into the uterus. The fingers should feel for the upper border of the placenta, and should detach it from the uterine wall by a series of sawing movements, the pulp of the fingers, and *not the nails*, being employed, and the pressure always directed *towards the placenta*, and not towards the wall of the uterus. The left hand should meanwhile push the fundus downwards from outside, to prevent too great a strain being put upon the uterus. Having in this way detached any adherent portions, the midwife should gather up the placenta into her hand, and allow the uterine contraction which follows to express both the hand and the placenta *en masse*. The placenta should be rapidly examined, and if there is doubt as to whether any shreds remain, the hand must be disinfected again, and again inserted to make sure, the left hand all the time keeping up counterpressure from outside.

The uterus being empty, the bleeding usually abates; but the next thing to be done is to give an antiseptic douche (this must always be done after a hand or any instrument has been inserted into the uterus), and this nearly always insures arrest of hæmorrhage. The temperature of the douche should

be 120° F. This is uncomfortably hot, but the heat causes contraction of the vessels and of the uterus, and is necessary if bleeding is still occurring; if bleeding has quite stopped, the douche may be given at 110° or 115° F. (1 drachm of cyllin to a quart of water is a suitable antiseptic and the right strength to use. From 3 to 4 pints will be requisite).

If hot water is not to be obtained, or if the bleeding is so urgent that the douche cannot be prepared, or if the latter should fail to have the desired effect, *bimanual compression* must be done. This consists in getting the uterus between the two hands (one placed behind the uterus outside and pushing it downwards, the other folded up inside the vagina against the fundus and pushing it upwards) and compressing it firmly.

If this fails, plugging the uterus is the last resort, and the two conditions necessary for success are:

1. *Asepsis:* some newly boiled material should be used.

2. *Thoroughness:* the uterus must be packed as full as it possibly can be.

The midwife will hardly ever be reduced to this extremity, as, if she has sent a sufficiently urgent message, help will have arrived long before; also, it is very rare for hæmorrhage to persist when the earlier methods of treatment are properly carried out.

Other things which should be done by someone else, while the midwife is working at the hæmorrhage itself, are: the foot of the woman's bed should be raised, her

head should be lowered, the window should be opened, and vinegar should be given.

The treatment of hæmorrhage, besides stopping the bleeding, requires that the shock and collapse attending the severe loss of blood should be combated. The surest way of doing this is to replace the blood lost by some fluid which will enter into the circulation and keep up the action of the heart; when death follows hæmorrhage, it is usually due to stoppage of the heart on account of there being no fluid upon which it can contract, and it is found that, provided fluid is supplied, even though the fluid be only salt and water, Nature soon makes good the loss of blood. The midwife's readiest method of getting water into the circulation is by giving a copious enema, and this is found to be an effective remedy for the collapse which accompanies severe bleeding.

At least 3 pints of fluid should be prepared (1 teaspoonful of common salt to a pint of water), and injected into the rectum with as little disturbance as possible. A convenient apparatus to use consists of a large rubber catheter, attached by rubber tubing to a funnel or douche-can. The soft catheter can be introduced farther into the rectum and with less difficulty than the bone nozzle; the jerky action of the enema-syringe is avoided; and the water flows in in a steady, non-irritating stream, and is much more likely to be retained. The patient should lie with her hips raised. The salt and water should be at a comfortable temperature, about 100° F., and the can or funnel be raised about a foot above the rectum, and kept there until

all the fluid has run in. One hand should guard the rectal opening meanwhile to prevent back-flow of fluid. After severe bleeding the patient should be kept absolutely quiet and still, and such nourishment as she can take should be given in teaspoonful doses at frequent intervals; she should not be left alone, for fear of recurrence of bleeding. A feeling of nausea, quick pulse, and flabby uterus are important signs that hæmorrhage is about to begin afresh, and the midwife should keep a sharp watch for the earliest appearance of these symptoms.

For secondary hæmorrhage bimanual compression holds out the best hope of success, as it can be applied almost immediately the hæmorrhage is noted, the only delay necessary being the time required to disinfect the hand and genitals. In the treatment of hæmorrhage everything depends upon presence of mind and promptitude in action; the midwife should therefore have in her mind a definite plan of campaign, and, when she goes to war against this terrible foe, carry it out step by step.

To shortly summarize the treatment, the uterus must first be emptied, then made to contract. To bring about contraction heat and pressure are the two means at the midwife's disposal: therefore, if possible, apply the first in the form of a douche at 120° F.; if not, use bimanual compression, remembering that the hand inside must be clean. Also bear in mind that the loss of fluid must be made good; therefore give a large rectal injection of salt and water.

Sometimes laceration of the soft parts causes hæmorrhage. Here again heat and pressure are the right treatment, and if bleeding continues, the midwife should keep up pressure upon the bleeding part until medical aid arrives and the laceration can be repaired.

CHAPTER XV

THE CHILD

As soon as the head is born the child's eyelids should be cleansed. After birth is complete the infant should be allowed to lie and cry for some time, in order that its lungs may be properly expanded. The pulsation of the cord should be allowed to cease, or nearly so, before it is cut, as the infant thus receives an additional supply of blood.

When about to cut the cord the midwife should first ascertain that no loop of intestine is contained within it, and should then squeeze the cord at a point about 2 inches from the umbilicus, to displace Wharton's jelly from the site of ligature and lessen the danger of the tie slipping, later, from shrinkage. One of the best materials for ligature is tape, $\frac{1}{4}$ inch wide, which has been cut into lengths, boiled, and stored in an aseptic bottle. The cord should be tied tightly with a reef-knot, and in tying care should be taken not to pull upon the abdomen, both knots being tightened by downward pressure with the fingers, and not by upward pulling. The cord must next be taken into the palm of the hand, and then cut with clean blunt-ended scissors about 1 inch beyond the tie.

(It is usual to put a second ligature upon the cord, higher up, before cutting—partly to save spurting of blood from the other end, and partly in case a twin be present: in the latter case it is necessary, and in all cases it is advisable.) The cut end must be squeezed and watched to see if any oozing is taking place, in which case another ligature must be put on between the first and the umbilicus.

The baby should next be oiled all over, and then washed with good soap and water at a temperature of 100° F., and dried with a soft towel. Before beginning, all things necessary for the baby's toilet should have been prepared and laid out, in the order in which they will be required, in a warm place. It is also important that the nurse should not sit in a draught while she is washing the baby. During the washing and drying the child should be examined all over to find out whether or not any abnormality or deformity is present—for example, the mouth and lips must be examined for cleft-palate or hare-lip, which would interfere with suckling and require spoon-feeding; the head for swellings or tumours (*e.g.*, *caput succedaneum*, a tumour of the scalp caused by pressure during birth; *cephalhæmatoma*, a bruising of the scalp and effusion of blood into the tissues forming it; *encephalocele*, a tumour connected with the brain, which has made its way out through a gap in the skull; little red tumours composed of bloodvessels (*nævi*) are also sometimes found on the scalp); the back for spinal tumour (*spina bifida*); the feet for club-foot; the anus for a closed condition of the passage (*imperforate anus*), which, if

untreated, will cause the baby's death; the male genitals for a tight foreskin (which requires circumcision) and for undescended testicle; the skin of the whole body for any rash or unhealthy condition; and all parts of the child for any injury which might have been received during birth. If any defect or deformity exists, or the child seems dangerously feeble or delicate, the midwife is bound by her rules to do her best to obtain medical aid for it; also, if later any inflammation, even of the slightest degree, is detected about the eyes or navel. If all is found normal, the umbilicus should now be well powdered with the dusting-powder mentioned in an earlier chapter, likewise all the folds of the body and neck; the stump of the cord should be dressed with clean linen or lint, and turned well up over the abdomen out of the way of damp from diapers; the buttocks should be smeared with vaseline, and the baby dressed and, unless the mother is ready to nurse it, laid in its own little cot, which should have been warmed by a bottle of hot water wrapped in flannel and placed under the blanket. Great care must be taken that the hot bottle does not burn the child. No preliminary feeding and no dosing with castor oil are required if the child is going to be breast-fed.

Feeding of Infants.

The mother's milk is the only perfect food for the infant; it contains all the constituents necessary for the support of human life in proportions exactly suited to the infant's digestive capacity. Breast-fed infants

are happier, stronger, have a better hold upon life, and are less liable to infant disease than hand-fed; the death-rate amongst them is also much lower. Breast-feeding makes the mother take a greater interest in her child, and seems to have the effect of increasing maternal affection. She has to take the baby up and give it personal attention several times a day; she herself also gets a few minutes' rest at frequent intervals. For the poor, breast-feeding is cheaper than adequate hand-feeding. Also, sufficient facts have now been accumulated to show that those people who were breast-fed in infancy have, other things being equal, a more stable nervous system, better able to stand the strains and stresses of life, and teeth with thicker enamel, and therefore less given to early decay, and consequently their digestion is less liable to fail, and they are longer lived than the hand-fed.

Every effort should therefore be made to promote breast-feeding, and very much may be done in furtherance of this end by preparation of the breasts during the latter part of pregnancy, perseverance in the puerperium, and careful regulation of the food and work of the mother after her stay in bed has come to an end. Many mothers during the first week or two have plenty of milk for their infants; but when they get up and go back to their work all is changed, and the milk ceases. The secret is that they are expending their energy in other ways, and there is none left for milk-production. This is especially true of the overworked and underfed slum-mother, whose latest infant is often allowed to starve while she works to buy bread

for the others. If such women could have a longer respite from hard work and a more generous diet *before the milk has actually ceased*, many of them would be able to go on nursing their babies.

Charitable friends are sometimes willing to help in these cases, if only they know the best form in which to give. Here extra meals to the mother, even one good meal a day, make an enormous difference, or a glass of warm milk, or even milk and water, taken half an hour before nursing, will enable the poor mother to provide a good supply of milk for her infant. This is by far the best way of humanizing milk—*i.e.*, by, as someone has said, 'passing it through the mother'—and to give for such a purpose is certainly one of the most useful ways of showing charity.

The nursing mother should, so far as is possible, be spared worry and mental excitement. She should also avoid outbursts of temper, as all these things tend to cause cessation of the milk. She must guard against disturbance of digestion, and should therefore take no articles of food likely to disagree with her. Acid things, such as lemon-juice or unripe fruit, taken by the mother are apt to cause griping and even convulsions in the infant, and should therefore be avoided; aperients given to the mother purge the child. A generous mixed diet, containing plenty of fluid (for example, gruel, milk, soup, cocoa, and water), some meat or fish, a sufficiency of fat (fat meat, butter, cream, or dripping), and some sound fruit and vegetables, is best for her.

Stout and other forms of alcohol are not necessary—

indeed, they are harmful; and, in view of the growing tendency towards alcoholism amongst women and the disastrous effect of alcohol upon infants, should be avoided. During nursing the mother should be propped up in bed until she is strong enough to sit up. Lying down to suckle is dangerous, as the act tends to produce drowsiness, and the woman may fall asleep and suffocate the child.

For the first month the child should be fed every two hours in the day, and one interval of four hours should be allowed at night, in order that the mother may get some sleep. During the second and third months the intervals between feeding should be slightly increased, and at the end of the third month the child should be fed once in three hours, with two four-hourly intervals at night. Breast-feeding should go on until the child is nine months old, when it should gradually be weaned, as by this time the milk is usually poor and watery and insufficient for its needs.

Crying of infants between meals is often due to thirst, which can be relieved by a teaspoonful of boiled water.

If, after all measures for increasing the quantity and quality of the milk have been tried, it is still found wanting, and the child ceases to gain in weight, breast-feeding should still be continued as far as possible, and the child should be given one or two supplementary meals during the day in place of one or two breast-feeds, the next best thing to breast-feeding being mixed feeding. No starchy food should be given until the child has begun to cut its teeth. This is

Nature's sign that it is getting ready for other food than the mother's milk, and at the same time its saliva begins to be abundant. This fluid contains a substance (ptyalin) necessary for the conversion of starch into sugar, without which conversion it cannot be absorbed. If, therefore, starch is given before the child has any saliva it simply stays in the stomach, and begins to ferment there, producing flatulence, or passes into the intestines, acts as an irritant, and sets up diarrhœa. The baby's comforter, beloved of babies, mothers, and nurses, is an abomination which should be eschewed by midwives. It gives the child its first lesson in deceit, distorts the shape of its mouth and palate, often alters the direction of growth of its teeth, and diminishes the amount of room within its nose, which diminution will later make nose-breathing difficult and favour the whole train of ills which follows mouth-breathing—namely, enlarged tonsils, adenoids, deafness, ear, throat, and chest diseases, and general debility.

HAND-FEEDING.—This is expensive, troublesome, unsatisfactory, and, unless carried out with extreme care as regards cleanliness and minute attention to detail, beset with risk, especially in summer and autumn, when milk is difficult to keep and children are very liable to diarrhœa. Dangers arise from disease in the cows—especially tuberculosis, which attacks those who drink the (unboiled) milk—from impure water used for washing cans, etc.; dirty vessels used for storing the milk; dirty hands of milkers; dirt from the cow-shed; the mixing of the previous day's milk with the new;

decomposition during transit; infection at any point between cow and consumer, and, after it has been delivered, from dirty milk-jugs, etc.; standing uncovered and exposed to impure air; dirty feeding-bottles, etc. Besides this, milk is often diluted or deprived of some of its cream before delivery, and is thus deficient in fat. Despite all these drawbacks, however, good cow's milk, suitably modified, is the best substitute for human milk available for the feeding of infants.

The milk should be bought from a good dairy, recommended by the Medical Officer of Health for the district, and known to be managed hygienically. It should have been obtained from a herd of cows (not from one single animal) which are habitually turned out to grass, and should be delivered twice daily in sealed bottles. The bottles after delivery should be put to stand in a vessel of cold water until required for use, and after being opened should be plugged with clean cotton-wool, which acts as a filter to keep out any germs of disease which may be in the air, and which would otherwise get into the milk and find in it an excellent breeding-ground. Milk should never stand in the bedroom or living-room, or in any place where the air is impure, as it readily absorbs any kind of impurity, and is rendered unfit for food. Many good dairymen now put the milk and bottles through a Pasteurizing and sterilizing process before delivery. The milk is strained, cooled, and then heated to 158° F. for twenty minutes, which has the effect of killing most of the active germs of disease which it may contain. If it were possible to obtain it germ-free, unboiled cow's milk would be

much better for infant-feeding than the same milk after it has been boiled; but as this is almost impossible in the summer and autumn months, it is better during the very hot weather that all milk to be given to infants should be heated at least to 158° F., and kept at this temperature for twenty minutes. In colder weather, if the milk is good and clean, this may be omitted, but the utmost care must always be taken to prevent contamination. The previous day's milk should never be used for infant-feeding, whether it appears sweet or not; for if, after sterilization, milk decomposes, although it may present no bad smell, it is much more poisonous than decomposed milk which has never gone through the sterilizing process. To explain this would take us too far afield, but it is a well-known fact that such milk is capable of setting up violent and even fatal diarrhœa and vomiting in infants.

Small quantities of milk left over from previous feeds should never be warmed up and given again to the infant; such may be boiled and used for older children. It is better to put only the amount which will be required for the one feed into the bottle. In giving boiled or sterilized milk to infants for any length of time, it must be remembered that heating milk deprives it of the 'fresh element' which is necessary to the maintenance of perfect health (whether in infant or adult), and if the child is to be kept free from scurvy, some fresh food must be supplied to it. Raw-meat juice, freshly prepared, and given once a day in tablespoonful doses, is excellent;

sweet orange juice also acts well, given in half-teaspoonful doses, twice daily, between feeds. A very sweet and quite sound orange must be chosen, and the clear juice, free from all pips or fragments of pulp, squeezed into a clean teaspoon and given. The method of preparing raw meat-juice will be given later.

As regards the difference between human and cow's milk something must be known, in order that the method of modifying the latter, to make it as closely as is possible resemble the former, may be understood.

First, then, cow's milk, being primarily intended for the building up of a powerful animal, the ox, contains a great deal more of the meaty constituent (proteid) than does that of the human mother—quite twice as much. Therefore, in modifying cow's milk the first thing is to dilute it with 1 or 2 parts of boiled water, in order to bring the proteid down to the required proportion. Again, when taken into the infant's stomach and brought into contact with the acid gastric juice, the proteid of cow's milk forms a hard curd (quite different from the soft, finely divided curd formed by human milk under like conditions), which delicate infants find very difficult or impossible to digest. Strong infants manage to deal successfully with this curd, adapting themselves in a wonderful way to the food supplied, but delicate babies soon give up the attempt, and the fact that this indigestible curd is formed from cow's milk is one of the great difficulties in the hand-rearing of such. To break up this curd is therefore our next endeavour, especially in those cases in which the child

is found to be incapable of digesting it; for this purpose barley- or lime-water is used, instead of pure boiled water, for diluting the milk. (The method of preparing these will be given later.)

Now the milk, having been diluted, is found to contain too little sugar, salts, and fat; these have therefore to be added. A half-teaspoonful of cream skimmed from new milk which has been standing for an hour or two, protected from contamination, and a like quantity of milk-sugar, added to each feed, are the best means of making up the required amount of fat and sugar; but ordinary sugar will suffice if it is clean, and if cream is unobtainable, two drops of cod-liver oil in each feed, or one or two shreds of fresh mutton suet boiled in the diluent (water or barley-water), will supply the necessary fat.

One grain of citrate of soda given in each feed will provide additional salts, and help to prevent scurvy. The milk of the human mother is alkaline; that of the cow, when it reaches the baby, is acid. The sodium citrate gets over this difficulty also. For those who understand what is meant by percentage composition, the following approximation will give the difference in the proportions of the main constituents of human and of cow's milk:

	Cow's Milk. (Per Cent.)	Human Milk. (Per Cent.)
Water	88	88
Sugar	4	6
Fat	4	4
Proteids	4	1½-2

Both contain a certain amount of salts.

In all that concerns the management of infants, and especially their feeding (whether natural or artificial), regularity, cleanliness, and simplicity are of the utmost importance.

If an infant is fed too frequently its digestive organs are deprived of the rest which is necessary to their health ; they are kept in a state of constant irritation and overwork, and soon refuse altogether to do their duty, the result being that the child loses weight and becomes ill. Again, if the intervals between giving the feeds are too long, the child becomes exhausted, and unable to digest the food when it is supplied. During the first two days the healthy full-term child requires very little food, and four-hourly feeds are sufficient for its needs, with a teaspoonful of boiled water given occasionally if it appears thirsty. On the third day two-hourly feeding should be begun, the feedings being timed punctually by the clock, and kept up regularly, as described under Breast-Feeding.

The child should always be taken up out of its cot and nursed during the giving of food, the bottle being held in the hand of the mother or nurse all the time, and care being taken to see that the part near the teat is kept full of milk, until all has been taken. In this way the taking in of air with the milk will be avoided, and one source of flatulence and vomiting removed.

The proper form of feeding-bottle to use is the simple boat-shape (preferably graduated in tablespoonfuls), without tubing or any complicated arrangements which would harbour dirt. At least two bottles should

be provided. These, after they come from the shop, should be washed, put into a saucepan with cold water, gradually heated to boiling, and allowed to cool in the water. This toughens the glass and sterilizes the bottle. They should, as long as they are in use, be boiled once a day, and after each use be cleansed under the tap until no trace of milk remains to be seen about them. The teat should be cleansed in the same way (being also turned inside out to remove any particles of milk which might stick to its inner surface), and the bottles and teats then should be put to soak, until required for use, in borax and water, which latter should be prepared freshly every day. Immediately before use the bottles should be rinsed in clean water, to remove all trace of borax.

The size of the hole in the teat is of some importance. For the newly-born baby it should be such as will allow one drop of milk to exude per second: this is about as much as the infant can conveniently deal with; later it can manage to get on more quickly, but too rapid feeding only leads to the return of food, and waste both of it and the nurse's time.

At the end of the meal the child should be put into its own warm little cot, and expected to lie there quietly for two hours at least. It will soon form a habit of doing so if the nurse and mother are firm, and a store of peace and quietness will be laid up for the family; also the child will be given its first lessons in self-control.

Quantity of Each Feed.—The average capacity of the stomach of a newly-born infant is 1 ounce (*i.e.*, 2 table-

spoonfuls), and this is enough for its first meals; by the end of a week it can take 3 or even 4 tablespoonfuls at a time, and after this it soon becomes a law unto itself as regards capacity, some children being able to take much more than others. Provided that the child is fed regularly and not too rapidly, it will rarely take more than it needs.

As regards composition of the food, at first it is well to begin giving 1 part of cow's milk to 2 (or, in the case of very delicate infants, 3) parts of pure boiled water; if this is retained and digested, the proportion of milk to water should be gradually increased until equal quantities of the two are given, then more milk, until finally the child gets pure milk. Some babies can be put upon pure milk much earlier than others. So long as the child is contented, retains its food, digests it (as shown by absence of curds from the fæces), and gains in weight, all is well; if, on the contrary, curds are being passed in the fæces, more milk is being given than the child can deal with, and if the latter is fretful, and especially if it does not gain weight, the food is not suiting it. Children who fail to thrive upon milk and pure water often begin to get on well when barley-water is used as the diluent.

Regular weighing is one of the best tests of progress, and should always be carried out. After the first week the healthy baby will gain about 6 to 8 ounces per week. As soon as increase in weight ceases, and *before decrease has begun*, a doctor should be consulted, in order that treatment may be carried out at the

very beginning of mischief; thus loss of weight can often be prevented.

Amongst the artificial foods, condensed milk is unsuitable for more than a short period, as, being a preserved food, it lacks the fresh element, and for this reason gives rise to infant scurvy. Sometimes, however, it is useful during the hot, dangerous months of July, August, and September, when (in towns at least) it is difficult to get good cow's milk. A good brand should be chosen, a little more generous amount allowed than that stated upon the tin, and some fresh food provided in addition — for example, raw-meat juice or orange juice. The sweetened condensed milk contains more sugar than the child needs, and is apt to give rise to an undue increase in weight, coupled with flabbiness. The unsweetened brands do not keep well after the tin is opened; also, when the milk has been suitably diluted, the mixture is usually found to be deficient in fat.

Allen and Hanbury's foods (numbers 1 and 2) contain milk, and are very simply prepared by the addition of boiled water. These are excellent for a short time, when pure milk cannot be obtained, but rather expensive.

Small quantities of Mellin's food are often useful as a laxative for babies suffering from constipation—*e.g.*, half a teaspoonful to the feed occasionally. Benger's and Savory and Moore's foods contain starch partly digested, and are therefore unsuitable for newly-born infants.

Ridge's food, Frame Food, Chapman's food, and Robb's nursery biscuits contain unaltered starch, and

are therefore unsuitable for infants under six or seven months of age—*i.e.*, until the saliva is fully formed, and the teeth beginning to be cut.

Glaxo and other forms of dried milk are being tried with apparent success, especially when it is difficult to obtain a pure milk-supply; but in these the fresh element is lacking, and during their use some fresh food must be supplied if the child is to maintain its health.

Preparation of Barley-Water.—Wash 2 teaspoonfuls of pearl barley twice, add 1 pint of water, allow it to come to boiling-point, strain off the water, add another pint of clean water to the barley, bring to the boil, and allow it to simmer gently until reduced to $\frac{3}{4}$ pint. Strain through clean muslin. It should be made daily, and in hot weather twice a day.

Raw-Meat Juice.—This is made by taking a small piece of lean beefsteak and scraping it with a clean sharp knife until it is converted into pulp. An equal quantity of cold boiled water is added, and the whole allowed to stand in a cool place for two and a half hours; it is then strained through muslin and is ready for use.

A very small piece of meat is all that is required, as the juice must be prepared freshly just before it is to be used, and for this reason the preparation of a large quantity at a time is wasteful.

Albumin-Water.—This is made by separating the white from the yolk of a new-laid egg, cutting up the white with clean scissors, and adding to it $\frac{1}{2}$ pint of cold boiled water. Cutting the white prevents the

frothing' which would follow beating, and saves the trouble of subsequent straining.

To Prepare Lime-Water.—Put a piece of unslaked lime the size of half an egg into a clean quart jug, pour cold water upon it, and allow it to stand (covered) for three hours. Effervescence will have subsided, and the upper part of the water become quite clear. This clear lime-water should now be poured off and kept in a clean tightly corked bottle until required for use.

Whey.—In the preparation of whey milk is separated into two parts, one solid (curd) containing most of the milk proteid and some of the fat, the other fluid containing the milk-sugar, salt, and water, and known as whey. It is often convenient to remove from milk a certain amount of proteid and to retain the other constituents. This separation is brought about by the action of a ferment, rennin, obtained from the stomach of the calf, and sold for this purpose under the name of essence of rennet. The rennet should be bought in small quantities from a good maker.

To Prepare Whey.—Take a pint of new milk, boil one half and add it to the other half, which is cold. This ensures a good temperature for the action of the ferment. Add to the warm milk 2 teaspoonfuls of essence of rennet. Stir well, and allow it to stand for fifteen minutes in a warm place. A thick curd will be formed; this must be broken up with a spoon and the milk strained through clean muslin. The curd remains upon the muslin, and the fluid part is the whey.

Sometimes it is desired to remove half the proteid from milk, and to retain all the fat, salts, and sugar. To do this, the milk should stand for two or more hours in a clean vessel, plugged with cotton-wool, in an airy place, in order that all the cream may collect at the top; the upper half (the milk with the cream) is then poured off, the lower half treated with rennet, and the whey separated as above. The whey is then boiled, and added to the upper milk, the result being that half the curd has been removed and the other constituents remain intact. It is important, before adding whey to whole milk, to boil the whey; otherwise the rennet in the whey curdles the rest of the milk. Boiling prevents the further action of the ferment.

Milk prepared as above will sometimes suit delicate infants who are unable to retain the ordinary mixture.

White-wine whey is sometimes useful for infants who require a stimulant; it should only be given under a doctor's orders. To prepare it, a glass of good sherry is added to a pint of warmed milk; the milk curdles, and must be strained through muslin as before.

Peptonized Milk.—In peptonizing milk digestion of its proteid-content is effected, before the milk is introduced into the stomach of the infant, by the action of a ferment, pepsin, obtained from the stomach of the pig, and added to the milk. Peptonized milk should never be given to healthy infants, and rarely, if ever, given except under medical advice, because to artificially digest the food of a normal infant is to relieve its own digestive organs of their natural work, and to

render them unfit for duty. In the case of delicate infants, however, peptonized milk may be required, and the midwife should therefore know how to prepare it.

Half the milk should be boiled, as before, and added to the other half. With this warm milk one of Fairchild's peptonizing powders (one to the pint) should be mixed. The milk should be covered and allowed to stand in a warm place for fifteen minutes; it should then be boiled, to prevent further action of the ferment, which would render the milk bitter. As soon as the milk has cooled to blood-heat it is ready for use.

It is of the utmost importance that only perfectly fresh milk and absolutely clean vessels should be used in the preparation of the above. None of them keep well, therefore only sufficient for the day's consumption should be prepared on any one day; if any is left until the next day, it must not be given to the infant.

Some of the Commoner Ailments of Infancy.

The greater number of infant ailments depend upon improper feeding in some shape or form. In breast-fed children the cause of the mischief must be sought in the mother: diarrhœa, vomiting, flatulence, griping, constipation, etc., may all be traceable to errors in her diet, and when these errors are corrected the evil ceases. Alcohol taken by the mother has an extremely injurious effect upon the child, producing indigestion, convulsions, wasting, and a train of ills.

The temperament of the mother as regards irritability, etc., also has an influence. The milk of a very delicate or overworked mother may not contain enough nutriment for the needs of the child, and one or two supplementary feeds in the day may be necessary. Before advising weaning in any case where the mother's milk seems not to agree with the child, a doctor should be consulted. In hand-fed babies the quality, quantity, or mode of preparation of the food, or the condition of the bottles, may be at fault, and these all require careful investigation. In all the so-called 'food disorders' of infants a reform must be effected in the matter of unsuitable food. Unless the case is one of a very simple character, the cause of disturbance obvious, and the result of treatment prompt and certain, a doctor should be consulted. The principles of treatment are to remove the irritant, to give the irritated digestive organs rest, and to keep the baby alive meanwhile. The first can be accomplished by giving the infant a teaspoonful of castor oil. The oil should be of the best and freshly bought. Rancid castor oil is very injurious. The second by withholding food for six hours, and the third by supplying water to the tissues. Here albumin-water is useful, for, while it makes little demand upon the digestive organs, it supplies the moisture necessary to keep the child alive until it is again able to take its food. The quantity of albumin-water to be given is the same as that required by the child for its ordinary meal—*e.g.*, a child which takes 2 ounces of milk mixture at one feed would take 2 ounces of albumin-water every two hours.

Be it understood that the above remarks apply only to mild cases of short duration, and not to those severe cases of continued diarrhœa and vomiting in which the child is wasted, the fontanelle depressed, and life almost extinct. These latter often require more than average medical skill for their successful treatment, and should certainly not be undertaken by the midwife.

Infant colic is due to the presence of some irritant causing fermentation and gas-formation in the alimentary canal. The child cries, its colour becomes dusky, the legs are drawn up, breathing becomes difficult, and often convulsions ensue.

The treatment is to put the child into a bath at 100° F., with a tablespoonful of mustard to the gallon of water. Send for a doctor, and if there is delay give the child a teaspoonful of castor oil to remove the irritant.

Milder cases are relieved by half a teaspoonful of dill-water. If the child is much collapsed, 5 drops of brandy should be given in a teaspoonful of water.

Constipation.—The possibility of imperforate anus must be borne in mind, and before trying to relieve constipation the midwife must assure herself that this is not the cause of the trouble. Breast-fed infants suffer less from constipation than those which are brought up by hand. In the former the trouble must be remedied through the mother, or by means of suppositories. Glycerine suppositories are very good for this purpose, and can be bought from any chemist. In hand-fed babies the difficulty is sometimes due to

deficiency of fat in the food, and the addition of a little cream or pure olive oil (half a teaspoonful in the day) will often remedy matters. Half a teaspoonful of Mellin's food given twice a day with the milk mixture acts well in some cases. Another very good laxative is manna, which can be bought from the chemist, and must be kept very clean; the dose is 5 grains, given twice or three times a day in the food.

Premature infants usually pass the meconium later than those born at term, sometimes as late as sixty or seventy hours after birth. Infants who get no colostrum usually require some aperient to help them to get rid of the meconium.

Vomiting.—Some regurgitation of food is inevitable when the stomach has been overfilled or the food taken too quickly; flatulence will also cause return of food; playing with the child too soon after feeding or excess of fat in the food acts similarly, or giving the meals at irregular intervals. The remedy lies in removing the cause of the trouble. If due to flatulence, another feed should be given after the expulsion of the 'wind,' and it will often be retained.

Serious vomiting should always receive timely medical aid, especially where the child is ceasing to gain weight. The calling in of a doctor should never be postponed until weight is being lost, as the condition is then much more difficult to treat successfully. Vomiting is sometimes caused by injury to the head during birth.

Hiccough can often be stopped by giving the infant a teaspoonful of boiled water.

Green diarrhœa is often due to simple causes, and can be cured by a small dose of castor oil. If, however, the stools are persistently green and contain curd, reform in the mode of feeding is indicated, and a doctor should be consulted. In cases of diarrhœa the buttocks should be smeared with some protective ointment—*e.g.*, oxide of zinc and olive oil made into a paste—as the very irritating fæces are apt to cause soreness of the skin if allowed to come into contact with it. After each cleansing the skin should be thoroughly dried with very soft material, and again smeared with the ointment before putting on the clean diaper. (Babies' diapers should never be washed with soda, and after washing and boiling with soap should be thoroughly rinsed in at least two waters before being dried. Insufficient rinsing before drying always results in soreness of the baby's skin.)

N.B.—The condition of the anterior fontanelle should always be carefully watched in cases of apparent disturbance of digestion in infants. Depression of the fontanelle or undue fulness are always signs of grave import.

Hæmorrhage sometimes occurs from the vulva of female infants; it usually subsides after a little while. Blood is sometimes swallowed from cracked nipples, and vomited or passed by the bowel. Apart from this, any discharge of blood from stomach or bowel is a sign of gravest danger.

Swelling of the breasts occurs sometimes in infants of either sex. It usually requires no treatment beyond daily washing with warm water. As misguided friends

are often anxious to treat this condition by rubbing, and as the latter is apt to result in hopeless deformity of the nipples of the girl (if the child be a girl) in after-life, the midwife will do well to put a layer of cotton-wool over the breasts, secure it with a bandage, and give strict directions that it is on no account to be removed. She herself should watch the breasts closely, and if signs of inflammation appear, send for medical aid.

Unhealthiness of the skin is often due to syphilis, and every case of the kind should be shown to a doctor. When a long course of treatment for parent or infant is ordered in these cases, the midwife should do her utmost to induce the people to persevere in taking the remedies, as by timely treatment, carried out for a sufficiently long period, some at least of the evil consequences of this terrible disease may be averted.

Jaundice.—Many babies suffer from a mild form of jaundice, which passes off without treatment in the course of a few days ; if, however, in addition to yellowness of the skin, the whites of the eyes turn yellow, the fæces are clay-coloured, and the urine stains the linen yellow, the case is one of a graver nature, and requires medical attendance. Sepsis at the navel, if not promptly treated, is apt to be followed by fatal jaundice.

Conditions of the Umbilicus (*Navel*).—*Sepsis of the navel* does not occur in healthy children, provided they are kept clean and dry in this region. If the navel is unhealthy, the child should be given a warm boracic bath, and a doctor should be sent for.

Fuller's earth as an application to the navel should be avoided.

If, on separation of the cord, a small red spot (granulation tissue) is found, it should be lightly touched with bluestone (copper sulphate).

Protrusion at the navel (umbilical hernia) sometimes occurs, especially in male infants who cry a great deal. The condition is often associated with tight prepuce and difficulty and strain in passing urine. The advice of a doctor as to the need for circumcision should be sought, and some form of pad applied over the umbilicus. A large, clean bone button covered with lint forms a good pad. It must always be larger than the hole through which the protrusion occurs, otherwise it will increase the size of the hole and do more harm than good; also, before applying the pad, the piece of protruding intestine must be returned to its place within the abdomen.

Phimosis, or tightness of prepuce, should never be allowed to remain untreated, as it is very apt to lead to inguinal hernia (rupture in the groin), besides other evil consequences.

Thrush is an unhealthy condition of the mouth, caused by the presence of a fungus which occurs in sour milk, and upon dirty nipples, feeding-bottles, etc. It is apt to attack infants when the mucous membrane of the mouth has been injured (as, for example, by pressure from the 'comforter'), and forms whitish patches in the mouth, which become painful. It can be prevented by scrupulous cleanliness in regard to nipples (or bottles and teats) and the mouth of the

infant. When actually present, the disorder should be treated by frequent application to the mouth of a mixture of equal quantities of glycerine of borax (obtained from the chemist) and clean boiled water.

Ophthalmia Neonatorum.—This term is used to denote an inflammatory condition of the eye, brought about by infection with the gonococcus, occurring during birth.

Every effort should be made to prevent such infection—first by care in cleansing the genital passage, when the mother is found to be suffering from gonorrhœa, just before the passage of the head; and secondly by cleansing the eyelids of the infant before the eyes are opened. This form of ophthalmia accounts for much of the blindness and semi-blindness which occur amongst school-children at the present time—blindness which could and ought to have been prevented. A child whose vision is impaired goes forth into life fearfully handicapped. At school he is always at a disadvantage, and when he becomes old enough to maintain himself the matter is even worse, for, except at some few industries specially suited to the blind, he is usually unable to gain a livelihood. Even a very slight impairment of vision seriously hampers him in the struggle for existence, cutting him off from many forms of usefulness, and from much which adds joy to life. Midwives have, perhaps more than any other class of people, opportunities for preventing this evil, and surely, when so much can be done by the expenditure of a little time and care they will do their utmost in this direction.

Next in importance to care in preventing infection comes watchfulness, in order to detect the first sign of mischief in the eyes; and it is here that the midwife is apt to fail. The trouble begins at the back of the eyelids, and shows itself at first by swelling of these. This swelling is usually overlooked and the eye itself allowed to become involved, sometimes even filled with pus, before a doctor is called in, and thus often the time in which it would have been possible to treat the lids and prevent permanent injury to the eye slips by; the front of the eye becomes ulcerated, and the ulcers, although they may heal under treatment, like any other wound, leave scars which render the eye opaque in patches, and prevent the possibility of perfect vision. In some cases the mischief goes farther than this, and one or both eyes are lost. Midwives do not usually see these cases of advanced eye trouble, and it is perhaps on this account that they regard neglect in this matter less seriously than they ought to do. The infant's eyes should receive attention at every visit, particularly where there is any suspicion of gonorrhœa in the mother; and it must be borne in mind that, though the eyes escape at birth, they can receive infection later, and will do so if anything contaminated with the gonorrhœal discharge is brought into contact with them. Not only does the infant run this risk, but other children of the household may also take ophthalmia if towels, etc., are not carefully looked after. The risk to the new-born infant is, however, greatest, for at birth the protective lymphatic tissue of the eye is absent.

When infection has occurred, if noticed early, it can be successfully treated at home under the direction of a doctor, though the treatment needs much time and trouble; but if the mischief has gone far, the child's best chance of sight lies in hospital treatment, where, if necessary, a special nurse can be employed to carry out the doctor's directions.

A baby with an inflamed eye must always be put to lie upon the same side as the bad eye, lest any discharge from the latter run into the sound eye; and if the midwife has to wait any time before she can get a doctor, she should spend that time in washing away the discharge from the inflamed eye with warm boracic lotion. It is useless, as a rule, to tell friends to wash the eye, as they fail to really cleanse it, and are apt to let the lotion, etc., become dirty.

Asphyxia Neonatorum. — There are two kinds of asphyxia of the newly-born—the blue, or livid, less serious form, and the white, or pallid, more dangerous variety.

When a child is born in blue asphyxia, it should first be ascertained that the air-passages are clear. In cases of breech delivery mucus and liquor amnii are apt to be drawn into the windpipe and lungs by attempts at breathing before the birth of the head. In such cases the child should be inverted and its mouth turned to one side, in order that any fluid which has gained access to the lungs may be got rid of. The midwife should sweep her (clean) little finger around the back of its throat to remove adherent mucus, and slap the back sharply to dislodge any plug of mucus which may

be lying within the larynx and preventing the entrance of air. The air-passages having been thus cleared, a dash of cold water upon the buttocks will usually cause the child to breathe and cry. Crying should be allowed to go on for some minutes, as it greatly aids expansion of the lungs.

In cases of white asphyxia, if pulsation in the cord has ceased at the time of birth, the child should be separated, and the midwife should put her finger slightly to the left of the middle line and press it upwards beneath the lower ribs, to feel whether or not the heart is beating. If the heart has stopped the child is dead, and nothing further can be done for it; but if even the slightest pulsation is felt, an effort should be made to resuscitate the infant. The air-passages should be cleared as before, and artificial respiration by Sylvester's method performed. Meanwhile, someone else should prepare a bath at a temperature of 105° F., and as soon as it is ready the child should be placed in it, and held by one person with its head above water, while someone else continues the artificial respiration. Soon either the heart will stop beating or the child will change colour. In the latter case, a dash of cold water upon the buttocks, as in blue asphyxia, will soon cause gasping, breathing, and crying. Let no midwife commit the error of putting a child born in white asphyxia into a cold bath until it has shown some sign of returning life.

If the cord is pulsating at the time of birth and the child does not begin to breathe, artificial respiration should be performed as soon as the air-way has been

cleared and before separating. If, as is sometimes the case, the midwife has only one hand at disposal, the alternate compression and relaxation of the chest with one hand, as described under the treatment of premature infants, will be found very effective in many cases. It is in some instances more important to keep one hand upon the uterus—*e.g.*, when hæmorrhage threatens—even than to use the two hands in resuscitating the child. Brandy rubbed upon the gums or chest of an asphyxiated baby will sometimes aid in its resuscitation; also, when hot water cannot quickly be obtained, to alternately flex and extend the body of the child before a fire will sometimes succeed. So long as the heart continues to beat the midwife should not relax her efforts: perseverance for half or three-quarters of an hour in artificial respiration, combined with the hot bath, is often rewarded in cases which at first seemed hopeless. In preparing a bath, the cold water should first be put into the vessel and the hot added afterwards, the whole being well stirred meanwhile; there is thus less danger that the water may be too hot in parts of the bath.

In Sylvester's artificial respiration the child is laid upon its back, and two movements—the one representing inspiration and the other expiration—are carried out alternately at the rate at which a newly-born child should breathe—*i.e.*, twenty times per minute, or somewhat more slowly.

In inspiration the chest expands and air rushes into it. To imitate this the arms are seized above the elbows and raised above the head, the chest being

somewhat pulled upwards at the same time, while another person steadies the body by holding the feet.

In expiration the chest returns to its former size and air is driven out. To imitate this, the arms are drawn down again and pressed against the chest. If the infant makes any respiratory effort, the midwife must time her movements to correspond with his, doing less and less as the child is able to do more and more.

The following are the conditions in which the C.M.B. directs the midwife to advise that a doctor be sent for :

'In the case of the child, when there is any abnormality or complication, such as—

Injuries received during birth.
Any malformation or deformity in a child that seems likely to live.
Dangerous feebleness.
Inflammation of the eyes, however slight.
Serious skin eruptions.
Inflammation about the navel.'

Premature Infants.

Infants born before the twenty-eighth to the thirtieth week do not, as a rule, live unless very special precautions are taken; at and after the thirty-second week they have a much better chance of life. In hospitals well-ventilated incubators, the air-supply to which is at first kept at 90° F., and its tempera-

ture gradually lowered as the weeks go on until the date which would have represented the full term of pregnancy is reached, are used with varying success as an aid in keeping such infants alive. When such helps are not available, the great aim must be to handle the child as little as possible, to keep it warm, and to supply suitable food at short intervals.

The tissues of the premature infant are much more soft and transparent than those of the full-term child; its muscles lack tone; its skin is redder; the layer of fat beneath the skin which is found in full-term children, and which helps to keep out cold, has in the premature infant not had time to be formed; the child's digestive capacity is slight; it has scarcely strength to take a deep breath and inflate its lungs, and hence these organs are in a state of airlessness (*atelectasis*).

Management.—The child should not be separated too soon. If it does not at once begin to breathe, it is better to avoid the ordinary methods of artificial respiration, and simply to compress the lower ribs with the thumb and fingers placed on either side of the chest at intervals of three or four seconds. As soon as the child shows signs of breathing the compressing hand should time its movements in such a way that they aid the efforts of the infant—*i.e.*, the ribs should be compressed when the infant expires (breathes out), and released during inspiration (the taking in of a breath).

The premature infant is often too weak to stand a bath immediately after separation; it should on this

account be cleansed with the softest material, and, with as little disturbance as possible, oiled all over (the oil in some measure seems to make up for the lack of subcutaneous fat), wrapped in *non-absorbent* wool, and put to lie in a warm place, the greatest care being taken that its mouth and nose remain uncovered, because the slightest covering is enough to prevent entrance of air. Cyanosis is a most grave sign in these cases, and usually means death if not promptly treated; therefore if the baby turns blue it should be promptly put into a bath of water at 100° F. —clothes and all if it is dressed, for while waiting to be undressed the baby may die.

The best food for these infants is human milk, which has usually to be drawn off with a breast-pump and given with a spoon, as the infant is too weak to take the breast; also, its mother has, as a rule, no food to give—at least, for the first few days. But the midwife with a large practice may be able to find a healthy woman who was confined three or four days earlier who would be willing to spare a few teaspoonfuls of milk for the poor atom of humanity who is placed at such a disadvantage. The breast-pump should be boiled before use, and the milk kept warm by keeping the bulb of the pump immersed in warm water as the milk is being conveyed from place to place. One teaspoonful of this warm milk should be given to the premature child every hour; its hold upon life is so very slight that it needs its food more frequently and in smaller quantity at a time than the full-term child. As soon as possible it should, of course, be

put to its own mother's breasts, and every means should be taken to encourage secretion in them.

A soft little nest should be prepared for the premature baby and placed out of the draught near the fire. These babies even more than others need a separate sleeping-place, as they are very easily smothered when the mother falls asleep if they lie in her bed. The child must be kept warm by means of warm-water bottles wrapped in flannel, as it has scarcely any power of heat-production, and its tiny body rapidly cools unless outside heat is supplied.

Premature infants should always be seen by a doctor, not only in order that they may have the benefit of medical advice, but also that in the event of their dying the unpleasantness and expense of an inquest may be avoided.

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